THE PRODUCTION AND MANAGEMENT JOURNAL OF THE NORTH AMERICAN PULP AND PAPER INDUSTRY

PULP & PAPER

DECEMBER, 1952 VOL. 26 NO. 13

Detroit's downtown area is a maze of [illegible] main streets and Michigan's main highways. Strange sights in a metropolis—[illegible] tower and wood piles disappear right where wood barge is being unloaded. —PRES. GEO. N. CARLETON.

Also in this issue—Special Coverage of CHICAGO ENGINEERING CONFERENCE [illegible] Digester Corrosion Survey, by JAMES B. LIGHTY; Electrical Engineering Section [illegible] J. OSBORN

Just 2 of the STOWE-WOODWARD ROLLS on DETROIT SULPHITE'S #9 machine

...there are more on the way for #10

STONITE ®
Special covering for Top Press Rolls, Smoothing Rolls

MICROROK ®
Special covering for Wet Press, Smooth Press and Size Press Rolls

TANNITE ®
Couch Rolls

STO-PRENE
Special synthetic top press rolls

SUCTION Press Rolls
TABLE Rolls
WIRE Rolls
FELT Rolls
PRESS Rolls
LUMPBREAKER Rolls
SIZE PRESS Rolls

For top performance . . . where it counts most, Detroit Sulphite depends on rolls by Stowe-Woodward, Inc.

Here, on its #9 machine by Beloit Iron Works as in most of America's leading paper mills, the critical rolls are by Stowe-Woodward, Inc.

Stowe-Woodward's reputation for quality built through years of service to the paper industry is one good reason for the choice.

S-W INC.

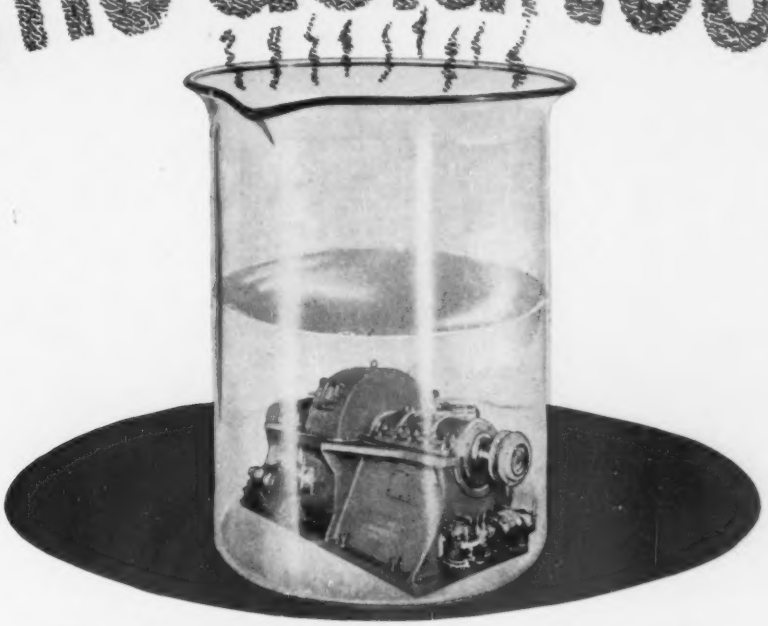
STOWE-WOODWARD, Inc.

Craftsmen in rubber

NEWTON UPPER FALLS 64, MASSACHUSETTS

New York office: WOOLWORTH BUILDING, NEW YORK 7, N. Y. • *On the West Coast:* HUNTINGTON RUBBER MILLS, INC., SEATTLE

The acid test



You can profit from the experience of the papermakers who've given Sutherlands the acid test of rigorous mill operation. On one tough job after another, Sutherlands have consistently improved quality, increased tonnages, and lowered costs. Your mill can benefit from the same solid understanding of stock preparation problems that made these results possible. Get the advice of your Sutherland engineer—it's yours for the asking. Write or wire us today.

SUTHERLAND

Sutherlands are manufactured in the United States by Valley Iron Works Company, Appleton, Wisconsin

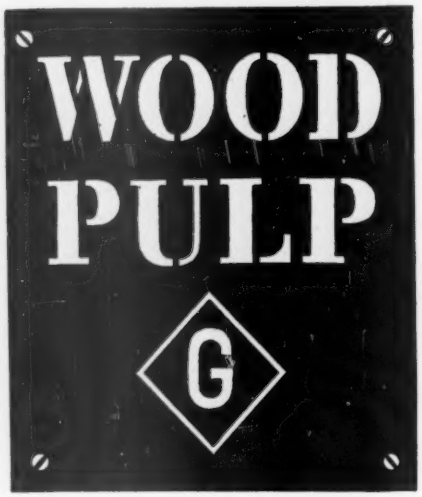
continuous beating systems

Designed, Engineered, Serviced

by SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.

Established 1886



"In the full tide of successful experiment."
THOMAS JEFFERSON

One of the most important attributes of American pulp and paper makers is their strong devotion to research and experiment for developing new products and uses.

The industrial greatness of the United States—in fact, much of the success of the whole American system of free enterprise—rests in large measure upon this never-ending quest for "something new" and better.

★

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— INCORPORATED —

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PULP & PAPER
"The Cellulose Age"
PRODUCTION AND MANAGEMENT JOURNAL OF THE NORTH AMERICAN PULP AND PAPER INDUSTRY

A MILLER FREEMAN PUBLICATION

Publication Office, Emmett St., Bristol, Conn.

Executive, Editorial and Advertising Offices
SEATTLE—71 Columbia St. (4); MA 1626

Other Editorial and Advertising Offices
NEW YORK—370 Lexington Ave. (17); MU 3-9294
CHICAGO—55 East Washington; ST 2-1100
NEW ORLEANS—3518 Dante St. (18); AM 2762
VANCOUVER, B. C.—675 W. Hastings St.; MA 7287
534 SW Third Ave., Portland 4, Ore.; 121 Second St., San Francisco 5; 815 Wilmer St., (17) Los Angeles

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Glamorizing Your Appeal to Colleges

Pulp and paper industry executives are doing the industry a service when they seize every opportunity to meet young college undergraduates, to explain to them the real opportunities in this industry. Others, outside the industry, have not always been accurate or sympathetic in their presentations of this industry. In November in Seattle, key executives from several big companies were given this chance at a meeting on the University of Washington campus. It might well be duplicated at other schools.

This industry knows quite well, and ruefully, too, that the oil industry never misses a bet to grab off the cream of the college crop. PULP & PAPER was informed by a Maine correspondent of a recent oil industry stunt in New England.

The oil industry asked universities in regions where paper is a major product to select a boy to go to a Boston affair, to be "An Oil Engineer for a Day." What a glamorous appeal! The pulp and paper industry might well think of how to compete successfully for that young man.

Paper Packages Need Improvement

Printers Ink recently published its own "packaging panel" in which several writers came up with some suggestions that would seem to merit the attention of the paper industry, as well as others.

For instance, one emphasized the need for easier ways to open the virtually "impregnable" packages. Another suggested more use of pouring spouts, more "break-in-half" packages when that type is a convenience, a better milk bottle top, a tissue box that will dispense both small and large tissues.

There's much food for thought in just these few proposals.

Cellulose—As a Chemical

"I recall to your minds that during the last 15 years, the greatest advances in chemicals have come through exploitation of the compounds known to our chemists as polymers. From the chemistry of polymers has come all the plastics and all the synthetic fibers.

"Cellulose is a polymer. It happens to be a natural polymer, but its characteristics distinguish it from most other polymers. For one thing, it is replenishable. Far more cellulose grows each year than is used. And for another, cellulose is among the cheapest of polymers. It is highly unlikely that a chemical that is so new, that is relatively cheap, and that is so abundant, has come anywhere near exploiting its potential uses." —*C. B. Morgan*, president, Rayonier, Inc.

Paper Uses—How They Multiply and Grow

Here are further optimistic forecasts by Canada's No. 1 research executive for this industry—and it would seem that the future of pulp and paper is definitely on the bright side. Says Dr. Lincoln Thiesmeyer, president, Pulp & Paper Research Institute of Canada:

"There are no cheap substitutes for pulp and paper. On the contrary, paper and paperboard are the cheap substitute for other things . . . gradual replacement in the U. S. of the tin can and the glass bottle by rectangular paper packages. A market once lost to a substitute is seldom regained.

"It takes no serious stretch of the imagination to conclude that per capita consumption in the U. S. may rise well over 500 pounds within the next ten years, or that the average per capita for many other countries may reach 100 pounds . . .

"As the supply of newsprint becomes more abundant to other countries, either through increased production in Canada, the U. S. and the Baltic area, or through production from their own mills, the demand for newsprint to maintain high advertising will increase.

"There is no reason to believe that multi-wall paper bags will not replace bags made of cloth or of other materials the world over, nor that the use of paper containers for milk and frozen foods and a host of similar end-uses will not also continue to grow on a world-wide basis."

IN THIS ISSUE:

REPORTS AND PICTURES OF THE ENGINEERING CONFERENCE

Including Corrosion Review, by J. R. Lientz, and Electrical Review by Johnnie Osborne. Conference pictures and reports on eleven pages.

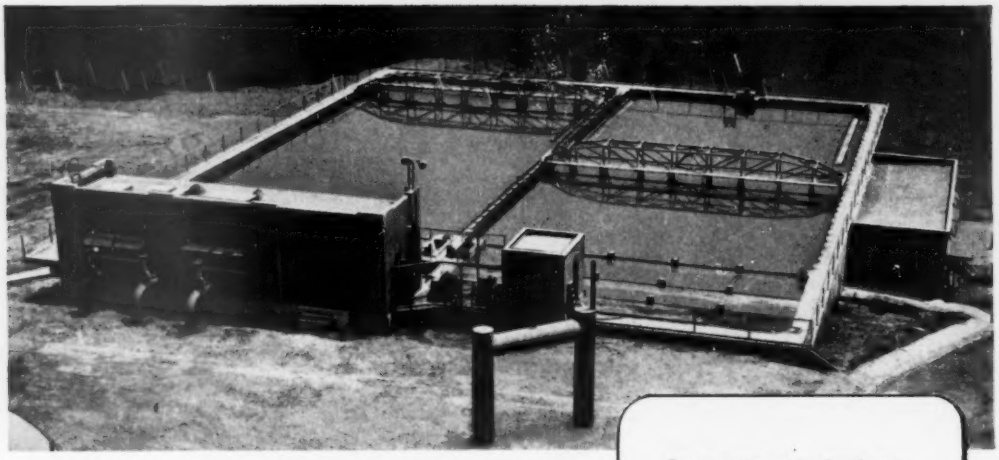
ENGINEERING CONFERENCE:
Human Engineering 30
Page of Pictures 31
General Comment 32
Corrosion Review by James R. Lientz 33
St. Regis Group 48
Hyer's Address 48
Elec. Engin'g Review by M. J. Osborne 52
Conference Notes 60
Maine Group 62
DETROIT SULPHITE PULP & PAPER CO. 37
K-C Exec. Vice Pres. 74
So. & S.E. Supts. 74

PULPWOOD SECTION:
Lake States APA 70
APPA South Tour 71
Uruguay Paper Mill 79
Latin American News 81
Mobile Laboratory 84
Sulfur in Kraft Gases By Bialkowsky-DeHaas .. 86
Corrosion Resistance Alloys By J. T. Gow 96
Marketing Paper 104
Supply Co. Notes 107
Expediting Shipments By J. W. Weiblen 110
PERSONALS:
Northeast . 62 Midwest ... 60
Pac. Coast .109 South 60-84

PULP & PAPER circulates all over the world. *It is read in virtually every pulp and paper company office and mill throughout the United States, Canada, Mexico, Alaska, Hawaii, the Philippines, Australia and New Zealand. It is read in many other offices and mills in Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Uruguay, Venezuela, England, Ireland, Scotland, Sweden, Norway, Finland, France, Germany, Austria, Belgium, Holland, Czechoslovakia, Italy, Spain, Switzerland, Soviet Russia, Poland, Yugoslavia, India, Pakistan, Israel, South Africa, China, Japan, Formosa, both near and far around the world, where pulp and paper are made.*

PULP & PAPER is published monthly, except July, when publication is semi-monthly, at Bristol, Conn., by Miller Freeman Publications, Inc. Subscription prices for 13 issues per year (12 monthly issues and also the valuable and comprehensive reference issue entitled the World Review Number) are as follows: In the United States, Canada, Mexico and other Pan American Union nations—$3 for one year or $5 for 2 years. In other countries—$4 for one year and $7 for 2 years. Entered as second class matter Dec. 4, 1951, at postoffice, Bristol, Conn., under the Act of March 3, 1879. Postmaster: Please send Notice 3579 to PULP & PAPER, 71 Columbia St., Seattle 4, Wash.

No Two Fingerprints Alike



No two water treatment problems are alike, either . . .

Ask any pulp mill operator. Chances are his water treatment problem isn't like yours.

First there is the problem of raw water characteristics. Rate of flow is important. And of course, the final result you need can only be accomplished by combining a good engineering knowledge with the proper types of equipment.

In mills throughout the world, many pulp producers have found it good business to put Dorr's experience to work. Whether your problem has to do with conventional or high rate treatment, write to us outlining your general requirements. Or, if you would like more information about the many types of Dorr equipment available, ask us to send you a copy of Bulletin No. 9141. THE DORR COMPANY, Stamford, Conn.

Process water must be free from turbidity in the production of kraft liner board. After a detailed study of methods for treating Ocmulgee River water, Macon Kraft Co., Macon, Georgia, uses this Dorr-equipped plant to answer the specific problem. Included in the installation are a Dorrco Flash Mixer, two Dorrco Flocculators* and two Dorrco Monorakes*. Effluent from the Monorakes flows by gravity to a clear well, from which it is pumped to the plant.

* Reg. U.S. Pat. Off.

Every day, nearly 8 billion gallons of water are treated by Dorr equipment.

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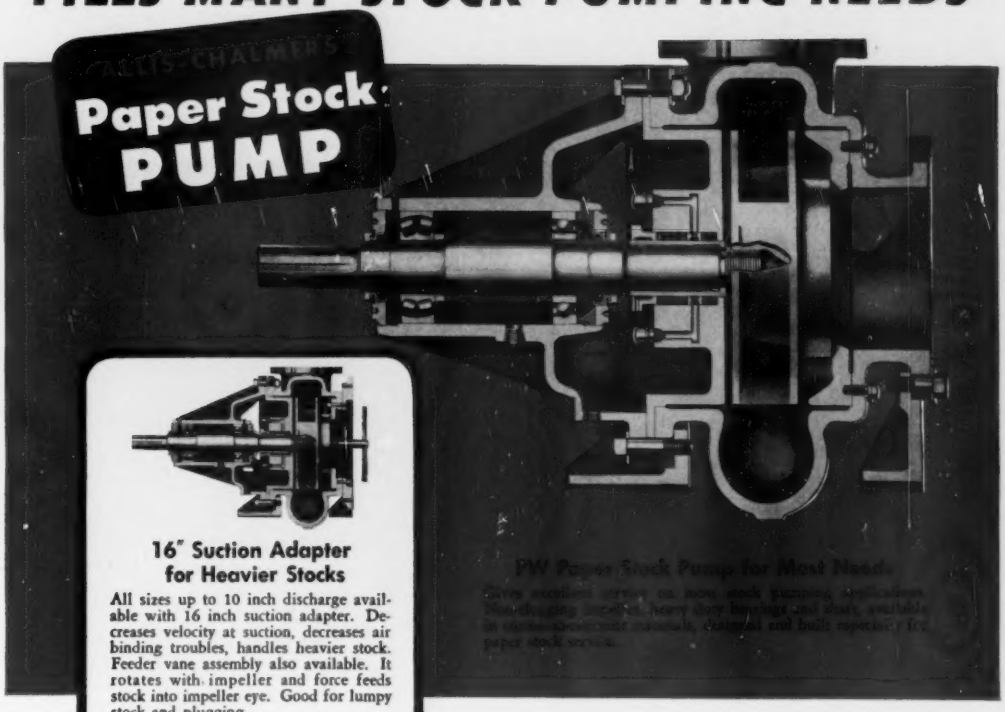
One Pump

FILLS MANY STOCK PUMPING NEEDS



16" Suction Adapter for Heavier Stocks

All sizes up to 10 inch discharge available with 16 inch suction adapter. Decreases velocity at suction, decreases air binding troubles, handles heavier stock. Feeder vane assembly also available. It rotates with impeller and force feeds stock into impeller eye. Good for lumpy stock and plugging.

Hi-Density Feeder for Difficult Applications

A separate unit from the pump, the *Hi-Density* feeder is mounted in the stock chest at the pump suction. Action of the vanes when unit rotates moves stock into pump suction. PW Pump with *Hi-Density* feeder attachment has been used successfully to move stock as heavy as 8% bone dry consistence.

WITH THIS WIDE CHOICE of options to select from, your Allis-Chalmers pump representative can select exactly the combination that will give you greatest production at lowest cost.

Remember, Allis-Chalmers can supply you with the complete pumping unit — pump, motor, control and drive — all of coordinated design and manufacture with the pump and motor mounted on a base, ready to run. Allis-Chalmers application engineers are familiar with paper mill problems. Next time you have a stock pumping problem, call your nearby Allis-Chalmers District Office or write Allis-Chalmers, Milwaukee 1, Wisconsin. For more information on the PW Pump, ask for Bulletin 08B6725.

A-3900

Hi-Density is an Allis-Chalmers trademark.

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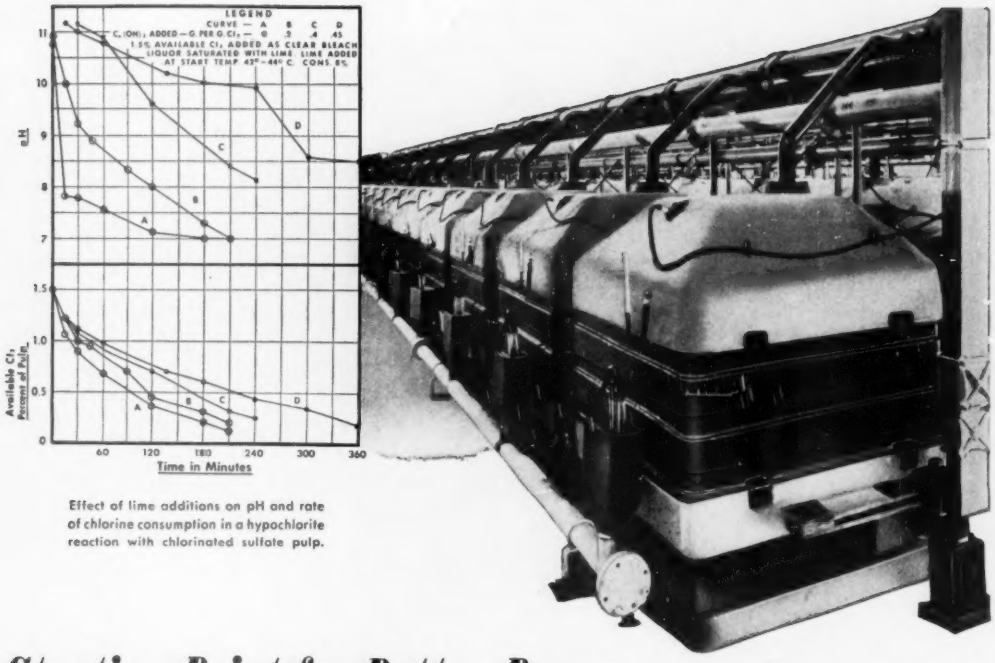
LEGEND
CURVE — A B C D
C. (OH)⁻ ADDED — G. PER G. Cl₂ — 0 .5 .4 .45
1.5% AVAILABLE Cl₂ ADDED AS CLEAR BLEACH LIQUOR SATURATED WITH LIME. LIME ADDED AT START TEMP 42°–44° C. CONS. 8%
pH
Available Cl₂ Percent of Pulp
Time in Minutes
60
120
180
240
300
360

Effect of lime additions on pH and rate of chlorine consumption in a hypochlorite reaction with chlorinated sulfate pulp.

Starting Point for Better Paper

The important bleaching step, at many mills, is handled with high-purity chlorine produced in Hooker "S" Cells at Niagara Falls and Tacoma.

So efficient are the "S" cells, that their widespread use by licensees and by Hooker is responsible for nearly one-half of the chlorine produced in the United States.

When you use Hooker Chlorine you can be sure of uniformity that keeps your bleaching methods constant. What's more, you can depend upon properly conditioned and inspected tank cars to insure trouble-free unloading and handling. Technical Service by Hooker assures you of experienced advice on the efficient, safe handling of chlorine and other Hooker Chemicals.

For copies of interesting and informative papers on bleaching listed here, please write on your business letterhead.

Send for This Helpful Bleaching Data

Bulletin No.

- 201 Process and Equipment for Making Bleach Liquor for Use Without Settling
- 211 Chemistry of Bleaching Chemical Wood Pulps
- 214 What Do We Know About Bleaching?
- 236 Importance of pH and Catalysts in Bleaching Operations
- 242 Production and Use of Unsettled Bleach Liquor
- 243 Procedures and Brightness Grades in Bleaching Sulfate Pulps

From the Salt of the Earth

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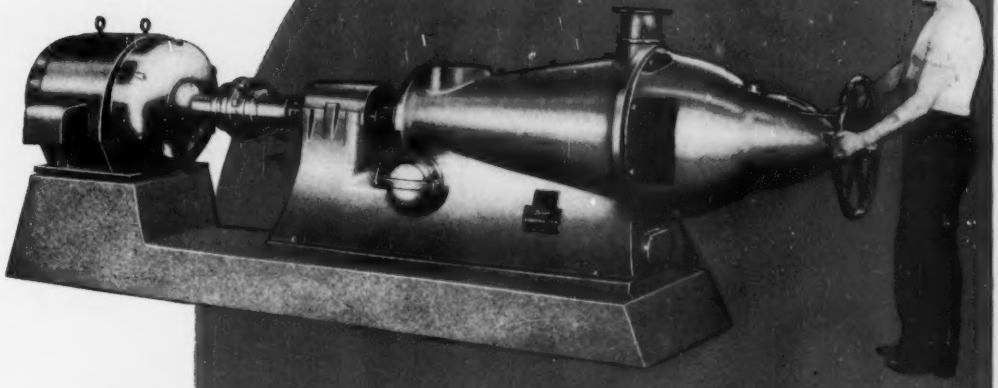
Plus positive control, improved stock, greater flexibility and lower cost



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IS YOUR ANSWER

The FIBREMASTER has twice the capacity of the famous Jones High-Speed Refiner. Yet its simplified, rugged design requires relatively little floor space.

And it has sacrificed none of the features of the smaller machine . . . its flexibility as a general utility unit for all stocks from news to rag, its improved stock control, economy of power, easy disassembly and low maintenance cost.

If you have a problem in high volume refining, you owe it to yourself to find out more about the FIBREMASTER.

Now Available with ACCRU-SET — automatic plug adjustment

This latest triumph of Jones engineering provides completely automatic, completely reliable finger-tip control of plug adjustment for uniform, pre-determined power throughout your stock run. Guarantees more uniform stock treatment, less operating horsepower, plus positive protection for plug and shell bars if power or stock flow fails.

Easily installed on any Jones Jordan, Fibremaster or Refiner. Write today for details.

To learn more about what the FIBREMASTER can do for your cost and quality controls, write for Bulletin EDJ-1020.

E.D. Jones

E. D. Jones & Sons Company, Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

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HIGH SPEEDS WITH UNVARYING ACCURACY

in single or multiple sheeting

NEW Clark-Aiken Cutters incorporate many forward-looking design features for speed and accuracy in setting, faster cutting with unvarying accuracy over long runs, and uninterrupted operation with minimum maintenance. No other cutter offers all these cost-cutting, production-improving features:

Infinitely-Variable Sheet Length Range within the range of the knife cylinder—18" to 60" with 18" cylinder; 25" to 86" with 25" cylinder.

Length Accurately Set and Constantly Maintained — The Clark-Aiken length adjustment system has been proved, through years of service, the most efficient for obtaining and maintaining accurate sheet length under all conditions.

Length Adjustments Quickly and Easily Made—Change gear for rough length adjustment can be removed by unscrewing one nut. Final adjustment can be made while cutter is in operation.

Clean, Sharp Cutting on Any Paper — The patented Clark-Aiken spiral knife operates with a scissors action insuring clean, sharp cutting of thinnest or thickest paper. Micrometer adjustment accommodates paper of any thickness.

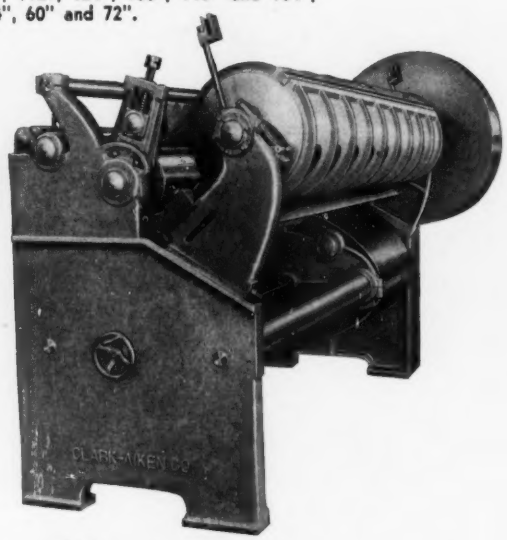
All Shafts Turn in Ball Bearings — permitting high speeds and insuring accurate alignment, maximum power efficiency and reduced wear and maintenance.

Many Other Features—Simple, precision squaring adjustment, ball-bearing slitters cut without dust, non-slip draw drum and pinch roll, self-sharpening fly knife, precision-cut gears and fibre pinions, efficient gun lubrication.

NEW Clark-Aiken Cutters and Layboys are made in eight standard sizes with maximum width capacities of 76", 88", 100", 112", 124", 136", 148" and 164", simplex and duplex. Smaller models: 48", 54", 60" and 72".

Write for bulletin.

NEW *Clark-Aiken* CUTTER



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STOCK-MAKER

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MORDEN "SLUSH-MAKERS" for completely pulping, deflaking, mixing and pretreating the furnish.

MORDEN "STOCK-MAKERS" for continuously beating and refining the stock ahead of the paper machine.

Many adaptations and elaborations of this system are used to suit various mill requirements. May we help you simplify and improve your preparation system with Mordens? Let us know your requirements.

SLUSH-MAKER
MORDEN
Machines Company
STOCK-MAKER

CORBETT BUILDING
PORTLAND 4, OREGON

Inspector gauges screen plate slot for precise .014 accuracy. Further microscopic examination double-checks careful fabrication at Union Screen Plate Company.

how **method** plus **material** give screen plates **longer life**

It takes science's tools in craftsmen's hands to do the careful finishing that adds months to screen plate service life.

And it takes a screen plate metal that doesn't crumble away in corrosive mill stocks.

That's why Union Screen Plate Company checks and rechecks finishing operations with caliper, feeler gauge and microscope. And that's why they recommend Inconel when other metals are giving unsatisfactory service.

And why Inconel?

First, because Union's engineers have found that Inconel resists corrosion.

Inconel plates in one rag paper mill showed no measurable slot enlargement from corrosion after three years of service. Plates of other materials often gave trouble within a year.

Second, Inconel is strong. In some cases 3/16-inch screen plates of the usual metals have been replaced by Inconel two-thirds as thick!

Third, it is fatigue-resisting and withstands severe vibration and shock.

And fourth, Inconel means smoother plant operation. Because Inconel plates do not rust or pit, surface stays smooth . . . "strings" of fibers do not build up . . . there's less hand cleaning . . . fewer shut-downs or stoppages. Unvarying slot dimensions keep screening efficiency high, rejects at a minimum.

All in all, Inconel screen plates measure up to years of extra service . . . with less trouble . . . at lower yearly costs. For additional information about Inconel screen plates, write to the Union Screen Plate Co., Fitchburg, Mass.

Today, Inconel, like the other Nickel Alloys, is on extended delivery because so much is needed for defense. Therefore, it pays to anticipate needs. Always order well in advance giving NPA rating and complete end-use information.

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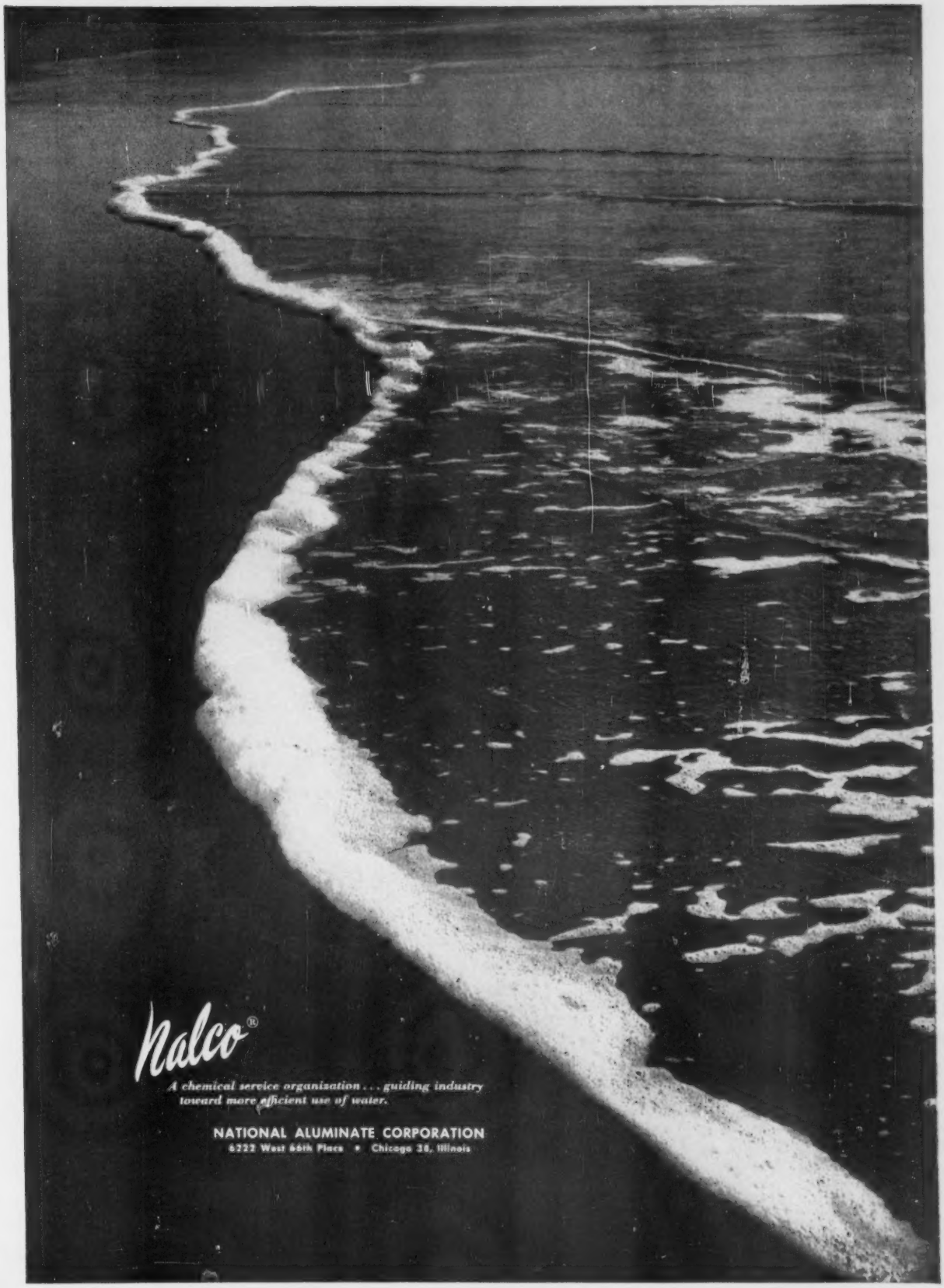
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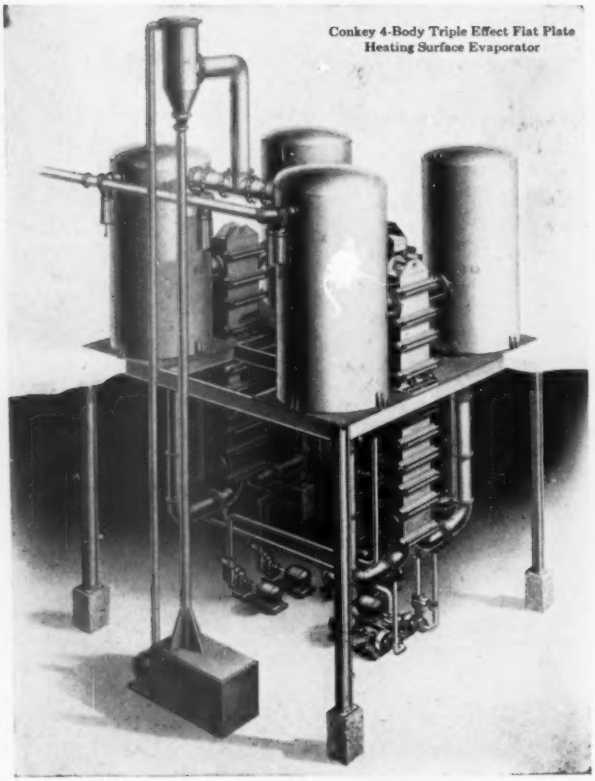

Conkey 4-Body Triple Effect Flat Plate Heating Surface Evaporator

Conkey Flat Plate Heating Surface Evaporator *with Rosenblad Switching System**

The proven system for avoiding stream pollution by sulphite pulp mill waste liquors that proved so outstandingly successful in commercial installations all over Scandinavia, is now adapted for use in this country by General American. *In every instance* where a Rosenblad Switching System has been installed, shut down time *and* scale removal *costs have been practically eliminated!* The Rosenblad System utilizes the condensate wash as a descaling operation carried on during full capacity operation of the evaporator. Surfaces subjected to boiling liquor are periodically switched with those in contact with vapor and condensate to clean heating surfaces during normal continuous operation. *Every part* of the equipment is switched, consequently scale is washed away from pipe lines, valves and vessels . . . in addition to heating surfaces.

At present in this country . . . Rosenblad Switching Systems in Conkey Flat Plate Heating Surface Evaporators are being constructed for full scale commercial operations. *Write today for detailed bulletin.*

*Patents Applied For

GENERAL AMERICAN TRANSPORTATION CORPORATION

PROCESS EQUIPMENT DIVISION

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General Offices: 135 South La Salle Street, Chicago 90, Illinois

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YES **THEY CAN,** in spite of shortages and slow deliveries on many stainless materials.

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This centrifugally cast pipe is produced in a wide variety of standard and special analyses, and in schedule 40 wall or heavier. It is superior in resistance to corrosion, in withstanding wear or abrasion, and in mechanical strength. And under present regulations . . .

You still can get it.

Also available are stainless castings, valves, digester fittings, etc.

Full information on *ESCO* Spuncast pipe is contained in our new catalog "Stainless and High Alloy Products". If you don't already have a copy, we suggest you get one from your nearest *ESCO* representative; or send us the filled-in coupon.

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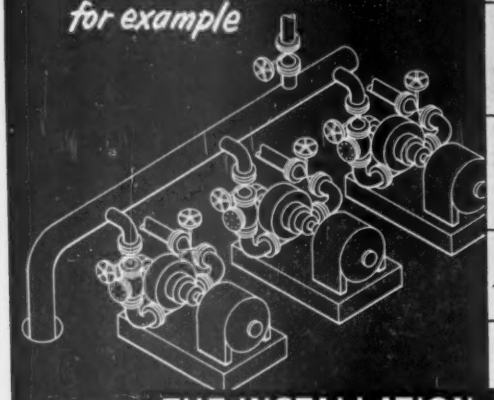
Can You Trust Your Checks to Hold Like This?

...on Water Pumps, for example



THE INSTALLATION

Crane Iron Body Swing Check Valves in 8-inch vertical lines on discharge side of water pumps supplying a large eastern paper mill.

VALVE SERVICE RATINGS

SUITABILITY: Working smoothly - no complaints

FEATURES: O.K. for either horizontal or upward flow

MAINTENANCE COST: None - no maintenance needed to date

SERVICE LIFE: Now better than other checks used

OPERATING RESULTS: No water or head loss

PRICE: In line with other makes

AVAILABILITY: Stock item - Crane product

THE HISTORY

The mill depends on these pumps for all water. Loss of head at the pumps would create a serious problem. The mill could take no such risks. Regularly, the check valves on pumps were replaced, but only to be found leaking between pumping cycles, a few months later.

It's now more than a year since the change-over was made to Crane Check Valves. There's been no loss of water, no maintenance or replacement of any checks on the pumps. That was proof enough for the mill, that Crane Quality means better valves —greater dependability and bigger value. As a result, 3 more of these checks were installed on a separate battery of suction pumps.

THE VALVE

Crane No. 373, 125-Pound Iron Body Swing Check Valves, brass trimmed. The long life and high seating efficiency of these checks, in 2 to 8-in. sizes, is in large part due to the Crane patented flexible disc-hinge design. Double spring mounting eliminates lost motion between parts, yet permits true, full contact of disc and seat at every closure. Also serves to absorb the shock of seating under backflow pressure. See your Crane Catalog or Crane Representative for full details.

The Complete Crane Line Meets All Valve Needs. That's Why

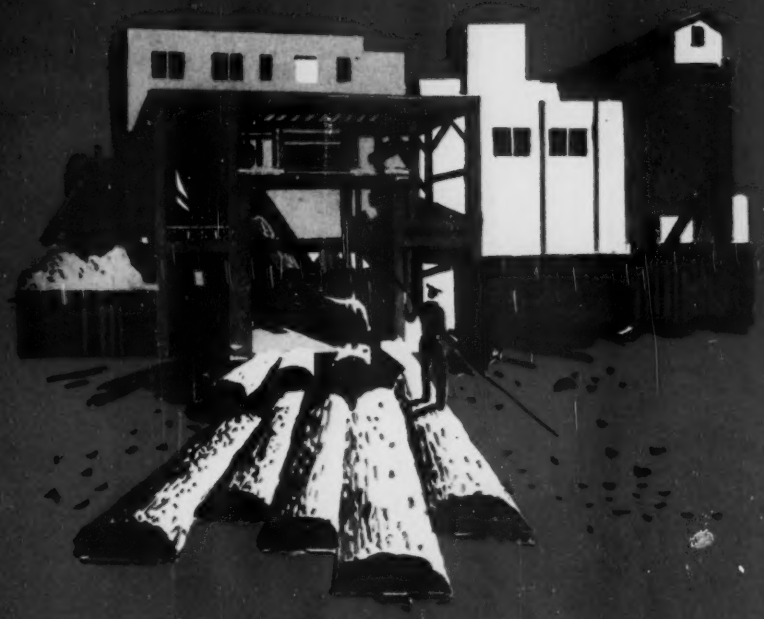
More Crane Valves Are Used Than Any Other Make!

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois

Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING



WHITER, CLEANER PULP

Puget Sound, long one of the greatest producers of unbleached sulphite wood pulp in the world, has now added fully automatic equipment enabling it to produce *bleached pulp* . . . whiter and cleaner than ever, yet retaining the long-fibre strength for which Puget has always been noted.

PUGET SOUND

PULP AND TIMBER COMPANY

BELLINGHAM • WASHINGTON

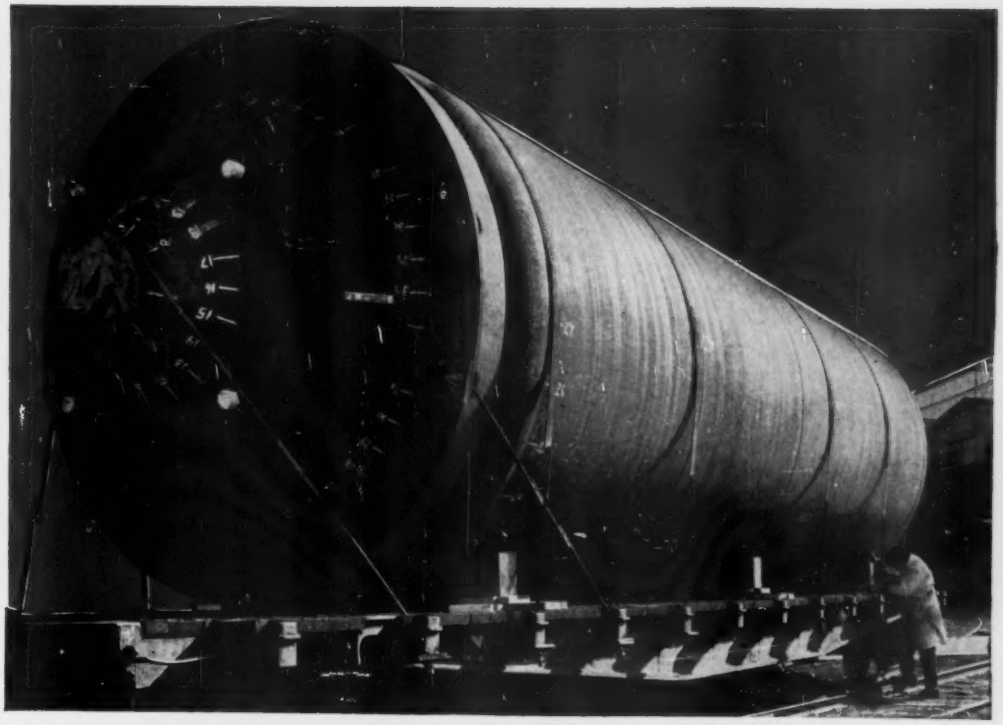
POWELL RIVER

UNBLEACHED SULPHITE PULP

★ STRENGTH
★ COLOR
★ SERVICE
★ DEPENDABLE SUPPLY

POWELL RIVER SALES COMPANY LIMITED

1104 STANDARD BUILDING - VANCOUVER, B. C.



10′ 7″ diameter, 42 feet high sulphate digester, weighing 130,000 lbs., made of Oxygenated Rimming Steel for corrosion resistance, leaving A. O. Smith Plant in Milwaukee.

Now we're making Sulphate Digesters of

Oxygenated Rimming Steel*!

A. O. Smith Research in Metallurgy and Welding makes another significant contribution to the Paper Industry . . .

Carbon steel with low silicon content, oxygenated by rimming, to obtain desired corrosion resistance, now becomes ideal material . . . in the hands of A. O. Smith technicians . . . for fabricating sulphate digesters.

Digesters made of this special steel, 2 to 2½ inches thick, were *first* developed by A. O. Smith. They have been in service for over two years with American Box Board Company, Crown Zellerbach Corp., Longview Fibre Company, Rayonier Incorporated, Union Bag & Paper Corp., West Virginia Pulp & Paper Company, Weyerhaeuser Timber Company.

Successful application to sulphate digesters is due to the investigations by the A. O. Smith metallurgical research laboratories, in cooperation with the A. O. Smith welding research laboratory.

Seams are welded with A. O. Smith electrodes that have proven to have the same corrosion resistance as the special parent metal . . . thus giving assurance of uniform corrosive characteristics throughout the digester.

Consult us on your process equipment problems. Contact the nearest A. O. Smith district office listed below.

*Patent Applied for.

Research and Engineering Building

A. O. Smith

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San Francisco 4 • Seattle 1 • Tulsa 3 • Washington 6, D.C.
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exporters of wood pulp
to all world markets

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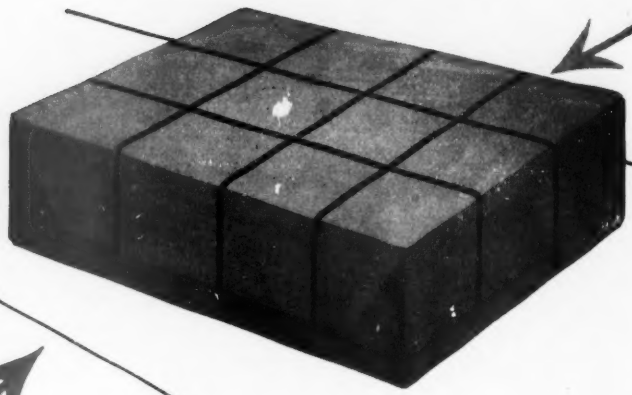
paper exporters
wood pulp



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RICE BARTON

Dump Valves

8 Inch Valve Assembly

Answering a need for a superior dump valve for the paper industry, Rice Barton Dump Valves have the following advantages:

- Passages of valve are clear, smooth and unobstructed.
- Plug type flange used to eliminate any stock accumulation in valve.
- Gate of valve flush with floor of tank which prevents unpulped stock from pocketing above valve.
- Valve may be opened and closed from a remote location handy to operator.
- Either water or compressed air may be used for actuating valve.
- Discharge in any direction by swinging valve on bolt holes.

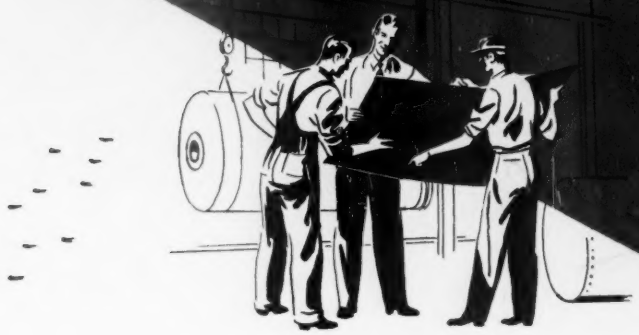
Construction — Valve body available in either cast iron or bronze.
Trim of bronze or stainless steel.

RBR 12-52

RICE BARTON Research Corporation
WORCESTER 1, MASS.

TURN WASTE INTO PROFITS!

LET CHEMICALS DO IT!



Pulp and paper mill "wastes" offer attractive returns on investment in chemical producing facilities. Converting effluent streams into sources of chemical by-products and adapting chemical plant techniques mean lower pulp and paper costs and a marked reduction in stream and air pollution.

CONSIDER THESE OPPORTUNITIES:

- Reduce sulfur consumption by recovery of sulfur dioxide from blowpit gases
- Improve biological oxygen demand of effluent streams through removal of contaminants
- Reduce air pollution by removal of sulfur dioxide from stack gases
- Recover heat through the burning of concentrated wastes
- Reduce steam costs through heat recovery
- Lower acid costs through improved efficiency of equipment

Vulcan has designed and built systems to translate every one of these opportunities into profit-making operations. If your goal is to expand and diversify sales and profits ask Vulcan to tell you of advantages which the growing chemical field can offer.

VULCAN ENGINEERING DIVISION OFFERS:

- TECHNICAL AND ECONOMIC SURVEYS
- PROCESS DEVELOPMENT
- PROCESS AND PLANT DESIGN
- EQUIPMENT DESIGN AND MANUFACTURE
- ERECTION AND CONSTRUCTION
- INITIAL OPERATION SERVICES

SULFUR DIOXIDE STRIPPING

Stripping of sulfite waste liquor for recovery of sulfur dioxide has been developed by Vulcan on an economic basis, particularly in conjunction with by-product chemical production. Recovered SO_2 can be returned to the acid plant in gaseous form or in aqueous solution.

ABSORPTION SYSTEMS

The modern design of bubble cap, perforated plate and cascade type absorbers has been applied to acid absorption systems and acid recovery units in pulp mills with resulting savings in equipment and operating costs.

WASTE DISPOSAL SYSTEMS

Complete systems for disposal of aqueous solution of organic waste materials have been engineered and built by Vulcan and are now in successful operation. These include systems for stripping of recoverable chemicals and utilization of waste concentrates as fuels.

HEAT EXCHANGERS

Special heat exchangers have been designed and built for handling of corrosive solutions containing fibers common to pulp mill operation. The special exchangers have been in operation and show consistent characteristics of high heat transfer coefficients over long periods of time with a minimum of fouling.

This large plant was designed and built by Vulcan for Commercial Alcohols, Ltd., of Gatineau, Quebec. It produced high grade alcohol from sulfite waste liquor which formerly was dumped into the Gatineau River. Sugars are taken from the liquor to reduce the BOD of the liquid by about one-half. Thus a potential waste disposal problem has been solved and what was once a waste product turned into a profit. This plant is similar to the plant of the Puget Sound Pulp & Paper Co., which was designed and built by Vulcan and the Ontario Paper Co. plant, for which Vulcan designed the distillation equipment.

Write for booklet describing the Vulcan sulfite alcohol installation for Commercial Alcohols, Ltd.

VULCAN ENGINEERING DIVISION

The VULCAN COPPER & SUPPLY CO., General Offices and Plant, CINCINNATI 2, OHIO

NEW YORK BOSTON PHILADELPHIA SAN FRANCISCO

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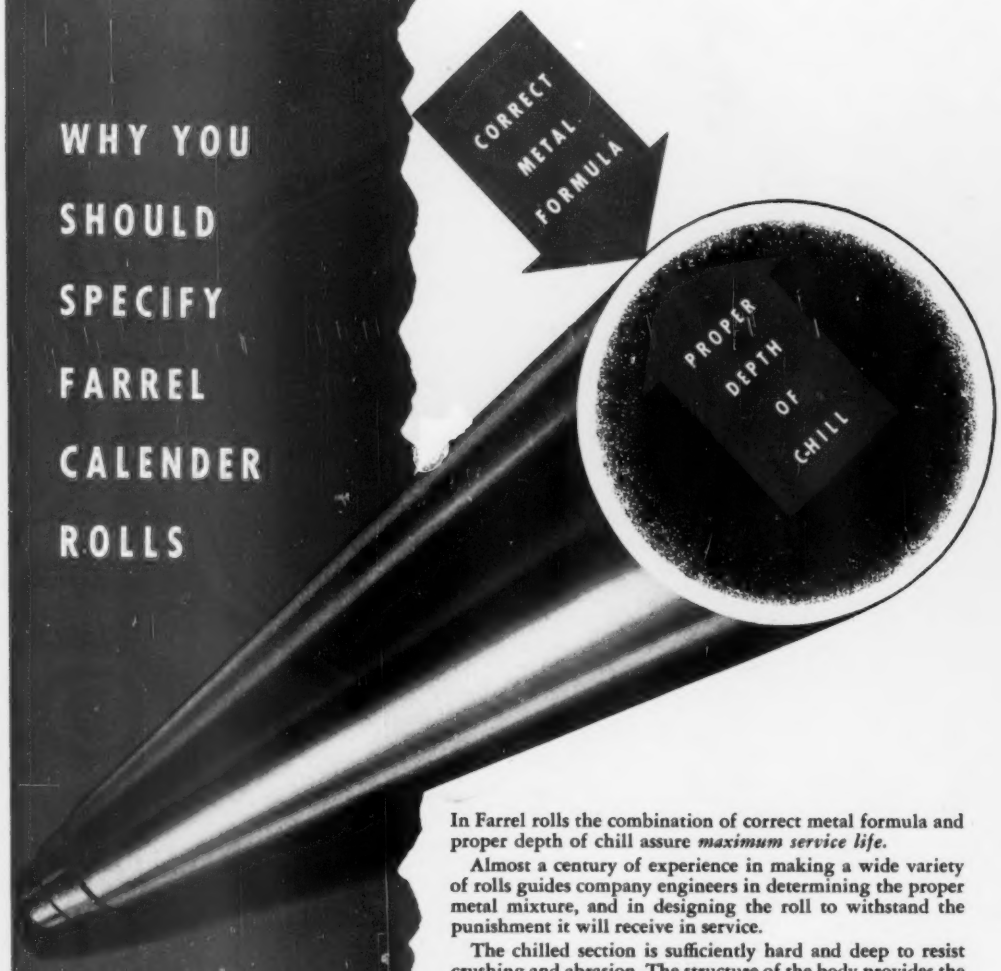
WHY YOU SHOULD SPECIFY FARREL CALENDER ROLLS



OTHER REASONS FOR SPECIFYING FARREL ROLLS

1 EXTREME ACCURACY — Rolls produced to extremely close tolerances.

2 CORRECT CROWN, precisely graduated, exactly symmetrical on both halves of roll.

3 QUALITY CONTROL—Every step of manufacture, from metal mixture and casting to grinding and inspection, is under constant and close control.

4 EXPERIENCE AND FACILITIES — Farrel has the experience and facilities to make rolls to meet your exact requirements.

In Farrel rolls the combination of correct metal formula and proper depth of chill assure *maximum service life.*

Almost a century of experience in making a wide variety of rolls guides company engineers in determining the proper metal mixture, and in designing the roll to withstand the punishment it will receive in service.

The chilled section is sufficiently hard and deep to resist crushing and abrasion. The structure of the body provides the strength to carry the load imposed on the roll in the service for which it was designed.

Surface hardness prolongs accuracy of the roll face, and, as a result, lengthens the time between regrindings. Correct depth of chill means that the roll may be reground many times before its usefulness is ended. These are the reasons why Farrel rolls last so long.

For more about the other reasons why you should specify Farrel rolls, send for a copy of Bulletin No. 116. No cost or obligation.

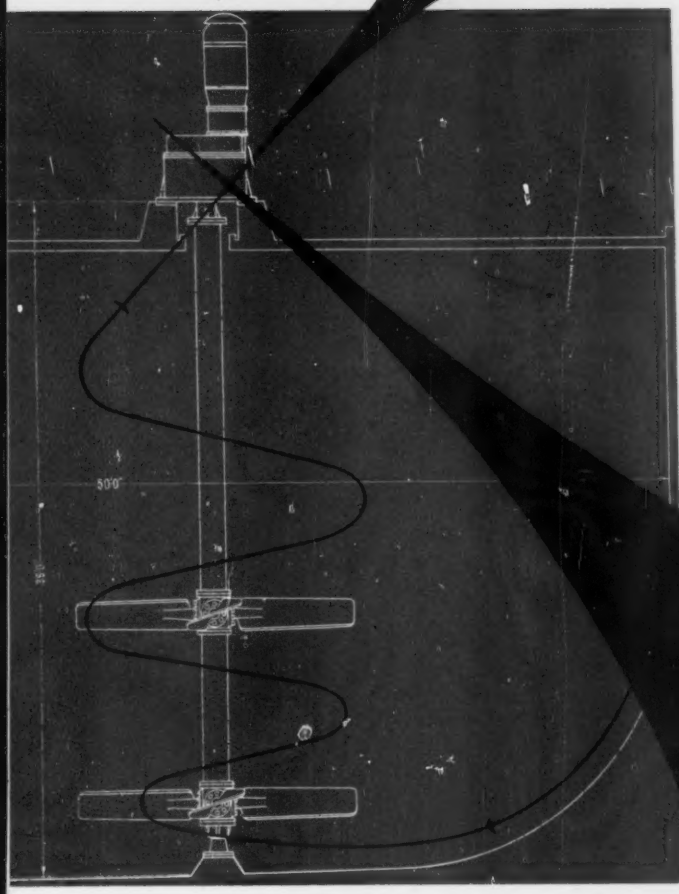
FARREL-BIRMINGHAM COMPANY, INC. • ANSONIA, CONN.

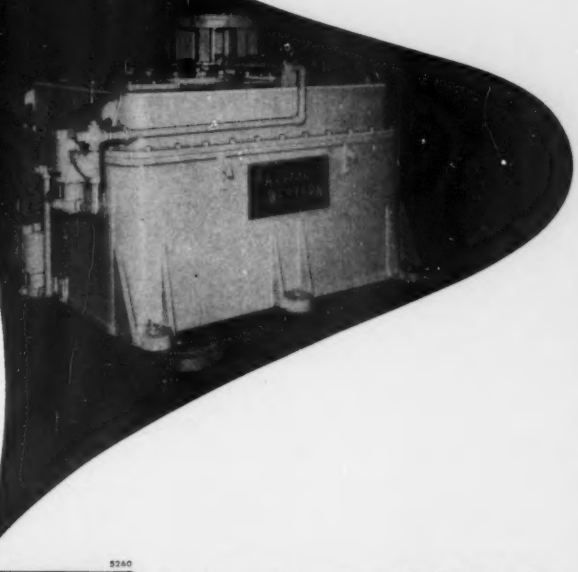
Plants: Ansonia and Derby, Conn., Buffalo, N. Y. • *Sales Offices:* Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

FB-728

Farrel-Birmingham®

TO CUT COST of PULP STOCK AGITATION





Use Larger Tanks and Specify Pacific-Western Reducers for the Agitator Drives

By agitating more pulp stock in a larger tank many progressive pulp mills have been able to cut the cost of production of the same amount of stock in several smaller tanks with their separate driving units. Better blending and more satisfactory agitation are additional benefits obtained in large tank installation.

Pacific-Western application engineers, backed by more than fifty years of service to the paper industry, are well equipped to design and produce the more powerful driving units required for large tank agitation. A letter or call to our nearest plant or office will bring a trained specialist to study your power transmission problem on the job.

A Pacific-Western TV-64 vertical triple reduction unit was designed and manufactured for the James Brinkley Company for use by a Pacific Northwest mill as an agitator drive for unscreened pulp stock in a tank 50′ in diameter by 34′ high. Two variable pitch propellers, each 15′ in diameter, provide the stock agitation.

The Pacific-Western unit has a ratio of 90 to 1 and was designed for operation with a 200 HP motor at 1750 RPM. The reducer has an output shaft 8″ in diameter and a thrust capacity, up or down, of 45,000 pounds.

5240

WESTERN GEAR WORKS

Manufacturers of **PACIFIC-WESTERN** Gear Products

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We like paper and it likes us

ASTENS are made with just the right balance of porosity and absorbency to fit your product. That's one of the reasons why they'll get along famously with your grade under your mill conditions.

Economy in the long run

ASTEN-HILL MFG. CO.
PHILADELPHIA, PENNA.

ASTEN-HILL LIMITED
VALLEYFIELD, QUEBEC

This "Baby" has the answers...

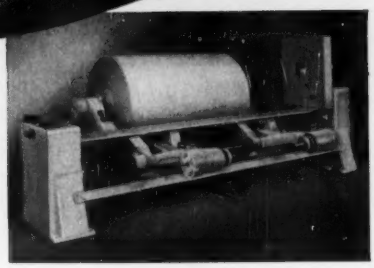
This "baby" digester actually works. It is a miniature of what tomorrow's rotary digester may be like. It is one of several such digesters regularly built by Biggs to undergo the laboratory tests that furnish the information which enables Biggs to maintain leadership in the field of paper making digester equipment.

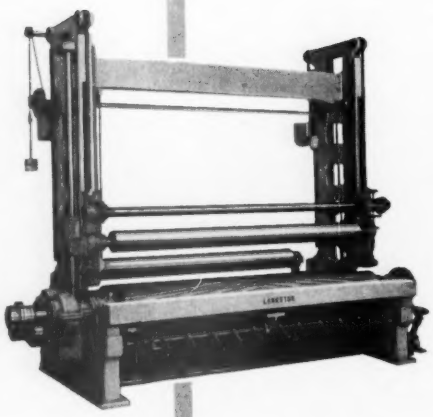
To better serve the requirements of the paper making industry Biggs has for years conducted extensive experimental projects aimed at the design and production of the most modern and efficient digester equipment.

It is only natural then, that if you are thinking of expanding your digesting facilities it will pay to consult first with a Biggs engineer.

THE BIGGS BOILER WORKS COMPANY
1015 BANK STREET • AKRON 5, OHIO

LANGSTON SHAFTLESS *Mill Roll Stands*

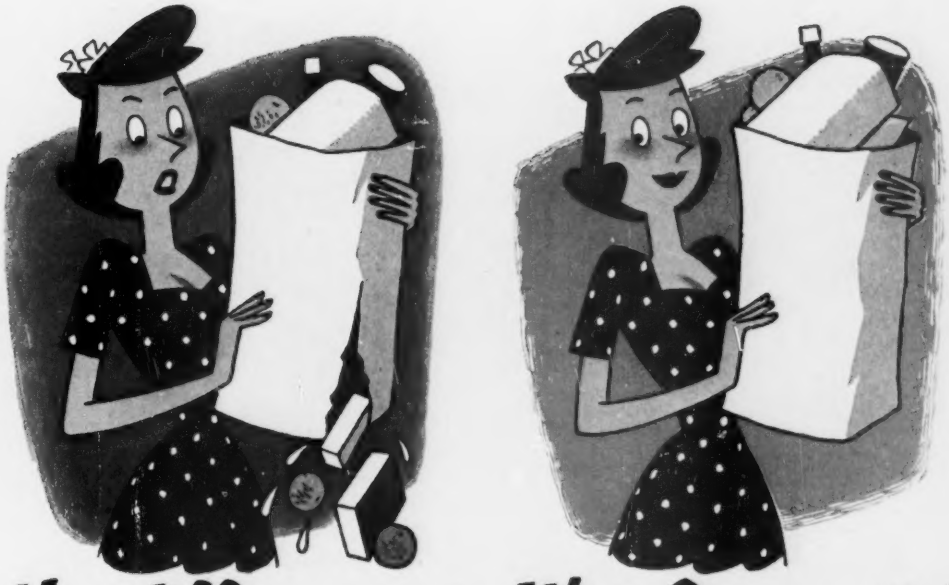




Various types of Langston Mill Roll Stands are available, equipped with constant tensioning, side register control, etc. Special construction can be provided to receive customers' reels or unwinding shafts. Shaftless type, self loading Langston Mill Roll Stands also are available.

SAMUEL M. LANGSTON CO.
Camden, N. J.

Langston SLITTERS and WINDERS



the difference is Wet Strength!

For High Wet Strength in Quality Papers

PAREZ® Resin 607—The Melamine Resin

- . . . maximum wet strength at lowest cost
- . . . best dry strength improvement
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- . . . assures uniform wet and dry strength
- . . . the most resistant of all wet-strength resins to hydrolysis or breakdown under moist conditions
- . . . a dry powder, it presents no storage problem
- . . . high efficiency in all types of furnishes makes it the favorite resin for *all* wet-strength needs.

. . . a sales-making property imparted by PAREZ® Resins

For Intermediate or Low Wet-Strength Papers

PAREZ Resin 614, A Liquid, Cationic Urea Resin

. . . high efficiency at low cost
. . . easy to use in your mill

For Unbleached Kraft Furnishes

PAREZ Resin 610 A Liquid, Anionic Urea Resin or **PAREZ Resin 620** A Dry Anionic Urea Resin

Where Urea Resins are required, don't fail to investigate these quality products.

Here is an index of four Cyanamid PAREZ Resins —each with specific properties to meet every wet-strength need. All impart *dependable* wet strength in controlled degrees—from the highest to low, depending on the type of papers treated. And of course your use of any of these PAREZ Resins entitles you to . . .

An Important Cyanamid "Extra"—

Expert Technical Service. The experience we have gained in pioneering the application of wet-strength resins to paper is at your disposal, through the services of our industry-trained technicians, who are familiar with every phase of paper-making.

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Mail this coupon for further information on Cyanamid wet-strength resins.
Please send me the Technical Bulletins checked below:

- ☐ Cyanamid Technical Bulletin #9C on PAREZ Resin 607
- ☐ Cyanamid Technical Bulletin #22A on PAREZ Resins 610, 614 and 620

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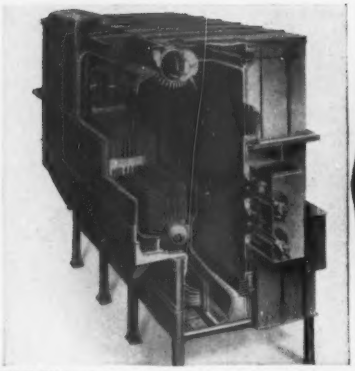
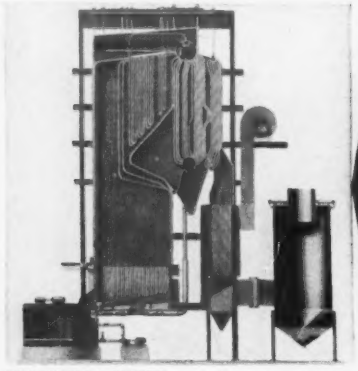


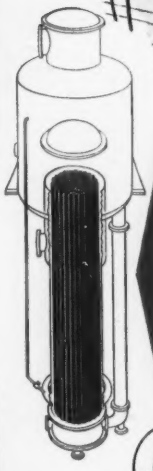
BOILERS—B&W boilers have a long and outstanding record for low-cost steam generation in pulp and paper mills. They span a range of types and sizes to satisfy every requirement of capacity, space, temperature, pressure, fuel, and method of firing. Each type combines the dependability of job-proved design with every economy of standardization commensurate with flexibility.



RECOVERY UNITS—Efficient chemical recovery and reduction, along with maximum steam generation per ton of pulp, are combined with economical operation and maintenance in B&W Recovery Units. Installations for burning waste liquors of the kraft, soda, and bisulphate (magnesium, calcium, and ammonium) processes have a total recovery capacity of over 16,000 tons. B&W recovery units were the first provided with automatic soot blowers to eliminate routine hand lancing.

PRESSURE VESSELS—Dependable welded processing units, in sizes and shapes for any paper mill requirements, are fabricated by B&W from carbon, alloy, or clad steels. All vessels are x-ray inspected and stress relieved.

time-proved aids to LOW COST production



TUBES—Seamless and Welded steel tubes are made by B&W in a range of carbon, alloy, and stainless steel analyses to satisfy every requirement for condensers, evaporators, heat exchangers, recovery units, boilers, and other paper mill applications. Modern improvements in pulp and paper processes impose a greater variety of tubing requirements than ever before. B&W Tube Representatives offer a wealth of experience on tubing problems to help users determine the analyses best suited for specific operating conditions.

BABCOCK & WILCOX

THE BABCOCK & WILCOX COMPANY

161 East 42nd Street, NEW YORK 17, N. Y.

P-744

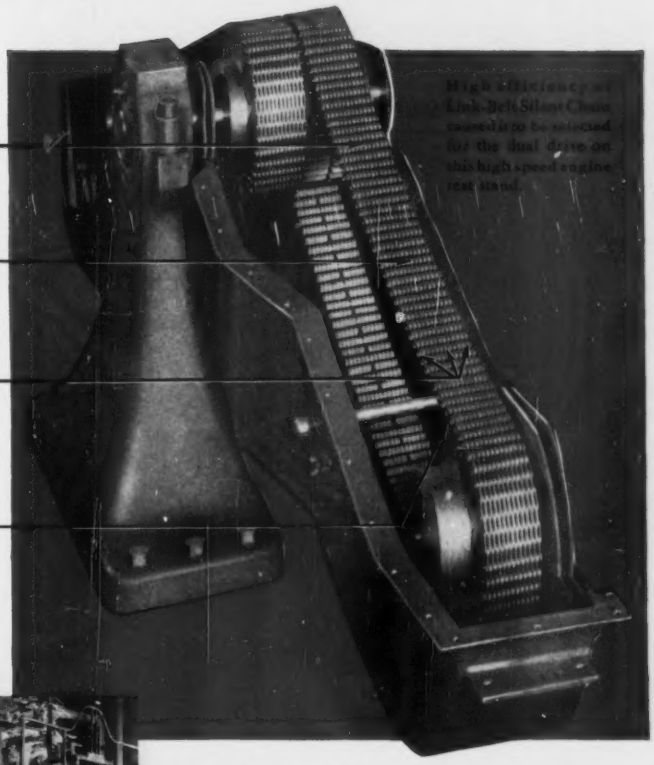
Choose the proved way
to transmit high hp at high speeds

Silverstreak Silent Chain does the job with a single strand—eliminating the dangers that come with one or more belts in a group carrying more than their share of the load.

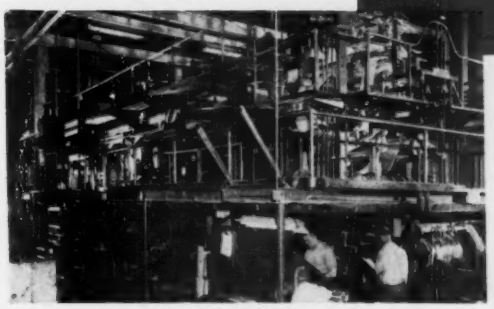
Husky Silverstreak metal link construction combines the ability to carry heavy overloads with the resilience that really absorbs shock.

"Pull" is distributed equally across Silverstreak Silent Chain. No possibility of uneven running—slapping.

Silverstreak Silent Chain doesn't rely on tension to get pulling power—chain meshes with teeth—gives POSITIVE drive—no chance for slip.



High efficiency per Link-Belt Silent Chain caused it to be selected for the dual drive on this high speed engine test stand.



Four 125 hp Silverstreak Silent Chain Drives power this press on which 46% of all "Readers Digest" copies are printed. Chain speeds of 4600 fpm are maintained 24 hours a day, six days a week.

LINK-BELT

SILVERSTREAK SILENT CHAIN DRIVES

LINK-BELT Silverstreak Silent Chain Drives are slip-proof . . . slap-proof . . . shock-proof

For the finest in modern power transmission, use Silverstreak Silent Chain the next time you have a demanding drive problem. These long-life drives—more than 98% efficient—have met every test for rugged service. There are many applications where Silverstreak Silent Chain has been in continuous operation for 15 years and more . . . without replacement . . . with only routine attention. Call the Link-Belt power-transmission engineer in the office near you for any information you require.

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 12,083

"HUMAN ENGINEERING"

VIEWS AIRED IN CHICAGO AND ELSEWHERE

It may be said, without fear of contradiction, that engineers and top technical and research men, as well as the executive officers, superintendents and other supervisors in a mill, spend a good part of their time dealing with human problems.

It might be thought that engineers and top technical men are not too concerned with these problems. But an analysis would show that in some mills at least *half of their time, half of their work,* involves human and not technical or engineering problems.

There were two events on the program of the annual Enginering Conference at the Morrison in Chicago in October which dealt with this problem. In fact, the two events went hand-in-hand—one, the main luncheon address by A. J. Miller, Jr. assistant director of industrial relations, The Mead Corp., Chillicothe, O.; the other, the opening paper of the conference rendered by Geo. W. Harper, University of Illinois.

"*Draw human beings into your blueprints,*" challenged Mr. Miller, a burly Arkansas-born, Tennessee-raised student of human nature. Incidentally, he is actually Mead's top man in the field for industrial relations, as his title ranks him next to Ford Y. Shepherd, vice president in charge of corporate relations, whose duties keep him pretty much in Washington, D.C.

"We have only begun to scratch the field of designing and building machines and plants to fit the personalities of people who work with them and in them," said Mr. Miller. "Simply more mechanization will not solve problems of employe unrest. All things made by man can be improved. We have made engineers into executives by training; how many industrial engineers and personnel managers have you made engineers?

"The training of employes should be coordinated with planning and engineering," he continued. "Bring the industrial engineer or the personnel manager into the picture when plans are in the talking stage. Human resources deserve the same attention as material resources."

Mr. Miller spoke from long experience, close to this industry. Before going to Chillicothe headquarters of Mead, he was secretary of the Lake States Pulp and Paper Association and was based in Appleton, Wis.

He made a suggestion that employes should be rotated in monotonous or fatiguing jobs. He recommended job "enlargement" policies. He urged more opportunities for "team play" in work organization.

There may have been some of his audience who wondered: "Where do we go from here?" in getting down to more particulars in designing machines to fit personalities. But Mr. Miller did go some steps farther than the opening address of the convention—his talk dovetailed right into that one by Mr. Harper.

PROPERLY IN THE MIDST of these leading personalities at CHICAGO ENGINEERING CONFERENCE is CHARLES SIBLER, the General Chairman who, after reorganizing and stepping up efficiency of TAPPI Engineering Division, pushed the buttons that set in motion one of two or three best Conferences ever held. Left to right: J. W. HEMPHILL, Mgr. Pulp & Paper Ind., Johns-Manville, who received watch as recognition of his pioneering and long service as Secy. of the division; WALTER C. BLOOMQUIST, General Electric Application Engineer who succeeded him as Secretary of Engineering Division; A. J. MILLER, Jr., Asst. Director of Industrial Relations, The Mead Corp., Chillicothe, and former Mgr. Lake States Pulp & Paper Assn., featured luncheon speaker; MR. SIBLER, who is Chief Engineer, West Virginia P & P Co.; KEN GEOHEGAN, President of TAPPI and Vice Pres., Howard Paper Mills; and GUNNAR NICHOLSON, Vice Pres., Mfg., Union Bag & Paper Corp., "father" of the Engineering Conferences.

The latter had said that if this industry is going to improve its safety record it "will come through the engineering approach." He attacked as a fallacy the common belief that most accidents are caused by human failure. He cited cases showing the physical hazard factor often is overlooked; the human element blamed.

"Usually both are present," he said, "and the basic attack must be on hazard elimination through engineering applications. We need more engineers in engineering, but most of all, we need more safety in engineering."

Midwest Mills Thinking More of Human Problems

A tour of some of the Lake States and Midwest mills by PULP & PAPER brought home the fact that human problems are getting more and more attention in the pulp and paper mills. Top management men said they are eager to learn—to find out how to handle some of these problems.

One president of a company was frankly upset because he had just finished reading an article that scolded management for not making "human beings" out of their research and technical men.

"My gosh, if they haven't learned to be human beings and to deal with human beings by the time they get to us, what have they been learning in their schools?" he asked. At one paper school, the young one at Western Michigan College in Kalamazoo, Dr. Al Nadelman, its head, told PULP & PAPER that he encourages and urges his students to go out for school activities, politics and other student group activities, so they will learn how to deal with their fellowmen.

It was generally agreed by some management men, and technical men, too, that the human relations abilities of the average Ph.D.'s on the mill payrolls are pretty low.

The issue was pointed up sharply insofar as the superintendents are concerned in the article by Jack V. Savage, Crown Z superintendent of Camas, Wash., in October PULP & PAPER, page 34, an answer to a Wayne University assistant dean who had been critical of the way superintendents were handling human problems—or the way he thought they were. Mr. Savage contended the standards of employe-supervisor relations are considerably higher than they used to be. The suggestion systems, job instruction training, and other media have helped to raise these standards, he said. A tour of mills in the Midwest brought out his article had been read with relish by a lot of superintendents.

Michigan Session

Getting back to the technical men, a Michigan sectional TAPPI meeting at Kalamazoo staged a frank and open round table on the subject "What's wrong with the technical departments?" Some top management men sat in, answered questions and gave their views.

With the shortage of technicians, and many fewer than needed coming from colleges, this subject assumed great import. A technical director bemoaned "always training new men, then losing them to other jobs." He said: "We lose them too soon—no wonder we can get nothing done!"

Plans Canadian Mill

Acadia Pulp & Paper Corp. has been incorporated in Fredericton, N.B., with a view to building a mill in New Brunswick's York county. According to Ralph V. Limerick, lawyer for the company, it is expected to start construction before the end of this year.

NEW LEADERS FOR TAPPI

GEORGE H. PRINGLE (left), Vice President in charge of White Paper Production, The Mead Corp., Chillicothe, Ohio, who is slated to succeed Ken Geohegan as President of TAPPI come February in New York. Former Chief Engineer of Mead mills, he was born in Nova Scotia, is a McGill University graduate, moves up in part as reward of his signal services as former Chairman of TAPPI Engineering Division.
KARL O. ELDERKIN (right), Vice President and Gen. Mgr. of new Bowater Southern Corp. mill being built at Charleston, Tenn., is chosen to become Vice President of TAPPI. He was a former Canadian papermaker who went to Arkansas to head up paper operations there for Crossett before recently taking the Tennessee post.
Other Nominating Committee selections for 3-yr. terms on TAPPI Exec. Committee: CHARLES SIBLER, Chief Engineer, West Va. P & P; HARRY MOORE, Pres. of Beloit Iron Wks.; JOHN BUSS, Provincial Paper, Toronto, and NORMAN BEARSE, Champion-Int. Corp.

SOME OF PARTICIPANTS in Chicago Engineering Conference (l to r):
L. O. MILLARD, Assistant General Sales Mgr., Link-Belt Co.; RALPH BERGSTROM, Manager, Pulp & Paper Dept., Swenson Evaporator Co., a hard-working member of Arrangements Committee; HANK STOESS, Fuller Co., who became Secretary of Materials Handling Committee; BILL McNALLY, head of Pulp and Paper Dept. for Link-Belt, who had preceded him on the committee and who also was Co-Chairman of Convention arrangements; FRANK HUTTON, Pulp and Paper Chief for Babcock & Wilcox and member of Digester Corrosion Committee; RAY SHILLUM, Vice Pres. of Brown-Hutchinson Iron Works, Detroit alloys fabricators.

MORE ENGINEERING MEETING PARTICIPANTS (l to r):
RAY HOLLANDER, Brown-Hutchinson Iron Works of Detroit; JAMES A. HOLEKAMP, Logging Engineer for American Pulpwood Assn., who described new mechanical equipment in woods; A. P. SCHNYDER, Ebasco engineer and Chairman of Material Handling Committee; MARIO C. CELLI, of Celli-Flynn engineers, McKeesport, Pa.; ALLAN HYER, Bagley & Sewall, who gave important address urging more business in government, to keep gov't out of business; BILL MITCHELL, Appleton, Wis., Consulting Engineer back from a trip to Mexico on pulp and paper business.

A GROUP FROM DIXIE MILLS

L. to r.: DANIEL E. BIVINS, Electrical Engineer, Brown Paper Mills, Inc., Monroe, La., a grad of Alabama Polytech (Auburn); BOB ADAMS, construction engineer for National Container at Jacksonville, from Berea College, Kentucky; Victor D. Davis, Power Plant Engineer for Brown at Monroe, where he has worked 25 years and came from Lake George; BRISTER P. PIERCE, Chief Engineer, Gaylord Container, Bogalusa, from Louisiana State College.

FROM NEAR AND FAR

A GROUP OF ENGINEERS from near and far got together in Chicago (l. to r.): DONALD PLATT, Project Engineer (for steam, electric power, maintenance) Crown Zellerbach, Camas, Wash. (an Oregon State grad); STEVE J. BAISCH, Design Engineer, Thilmany Pulp & Paper Co., Kaukauna, Wis. (from U. of Wisconsin); ROBERT McCULLY, Plant Engineer, International Paper Co., Niagara Falls, N. Y., (a McGill product); HENRY REIS, Construction Engineer, Rhinelander Paper Co., Rhinelander, Wis. (an Armour Institute grad).

YOUNG NEW CHAIRMAN OF DRYING COMMITTEE

OTHER PARTICIPANTS AT CHICAGO (l to r.): H. C. CRANE, President, Crane Engineering Sales, Appleton, Wis.; GEORGE W. PETREE, District Engineer, Byron Jackson Pump Co., Milwaukee, Wis.; J. H. SNYDER, Manager, Bucksport, Me., Mill of St. Regis; DICK TEMPLE, Valley Iron Works, Appleton; GEO. H. FERGUSON, Alvin H. Johnson & Co., New York engineers, and CURT A. YOUNG, Engineering Mgr., Riegel Paper Corp.

AT CHICAGO SESSIONS

BARRY M. TURNER (left), chief engineer of the Northern Mills for International Paper Co., New York, and E. H. DONLEY (right), sales director for Babcock & Wilcox, New York region.

ENGINEERS MEETING

A BACKWARD LOOK—A FORWARD ONE, TOO

Still the "Blue Ribbon" event of this industry for the technical, operations and engineering men in the pulp and paper field, the Annual Engineering Conference drew 475 delegates to the Morrison hotel in Chicago in Mid-October.

Continuing programs of research and discussion in several fields were carried through and especially in the field of chemical engineering, in electrical and power fields and also in the drying and ventilating divisions, the programs were considered outstanding. The advancement of Charles Sibler, chief engineer of West Virginia Pulp & Paper Co., who was chairman of the Engineering Committee, to the Executive Committee of TAPPI in New York in February, will be, in one respect, recognition of the outstanding job he did in his first year in heading this group.

Being a serious and hard-working conference, this meeting is pretty much a stag affair and its strength is in the fact that the various committees are carrying on continuing projects from year to year. Probably the most outstanding event was the progress made by the chemical engineering division under James R. Lientz, Union Bag's Pulp & Paper Division manager. It is gathering a mass of useful information and data on a problem of digester corrosion in the kraft industry which is costing the industry millions of dollars every year. It has been developing the use of the Audigauge for the measuring of corrosion scientifically and considerable strides were made in this direction at the meeting. Elsewhere in this issue is an article by Mr. Lientz, especially written for PULP & PAPER, reviewing progress of digester corrosion work.

There is still no pat answer to the problem—and how could there be when many mills do not know today to what extent they will be making semi-chemical pulp or making pre-hydraulized kraft, for example, in a few years to come? The discussions of digester corrosion were so engrossing that the committee members and their associates and the steel, alloy and brick specialists cooperating with them, were still in session even after the party for the big banquet was underway. It is considered inevitable now that a separate corrosion committee will take its place in the Engineering Conference within perhaps a half a year. Undoubtedly, this will be headed by Nick Shoumatoff, West Virginia Pulp & Paper process engineer, who has headed the sub-committee.

In view of the corrosion problem importance, some have expressed a fear that the chemical engineering committee will have its heart cut out by the setting up of this separate new committee. However, there should be plenty of the other serious and important problems which the chemical engineering group can tackle—for instance, water treatment and stream pollution.

The work of the hydraulics committee headed by K. J. Mackenzie of Eastman Kodak, also is significant. This, too, was not one of the original committees of the engineering division, although it may now be considered an "old-timer" among them. Its outstanding accomplishment has been in the determination of the co-efficients of frictions of the flow of stocks and pulp in pipe lines.

Another committee that won praise in Chicago was the electrical group, particularly because of the development of a manual for the specifications for selection of electrical cable. Responsible for this useful job well-done, is Alfred C. Mortenson, of St. Regis Paper Co., Pensacola, Florida. In connection with the review of electrical and power developments in the Chicago Engineering Conference, PULP & PAPER is pleased to present elsewhere in this issue another especially prepared report written for this magazine by Johnnie Osborne, electrical engineer for the new Bowater Southern Paper Corp., in Tennessee, formerly with Crossett and before that with the Atomic Energy Commission at Oak Ridge.

AT A SESSION CALLED BY CHAIRMAN CHAS. SIBLER to discuss "What to do about—and for—the Pacific Coast Engineers?" (see our story for the outcome). Among those present (top row l to r): WM. McKENZIE, Chief Engineer, Simpson Logging Co.; BURKE MORDEN, President, Morden Machines Co.; JOE KRAUTH, Asst. Resident Engineer, Rayonier Inc., Shelton, Wash.; DON LAWSON, Resident Engineer, Rayonier, Port Angeles, Wash. Below (l to r): W. H. (HUB) RAMBO, Industrial Plant Engineer and woodroom specialist, Portland, Ore.; JACK WILCOX, Manager of Process Equipment Div., Electric Steel Foundry Co.; JOHN S. FRANKS, Drew Engineering, Portland, and WM. D. BELL, Asst. Res. Mgr., Rayonier, Hoquiam, Wash. Others present included Don Platt, Crown Z; Bill Shelton, Longview Fibre, and W. D. Vincent, Gen. Electric, Seattle.

Next Year To Quebec

Next year the Engineering Conference will go to Montreal or Quebec. While it had been announced at one of the final meetings in Chicago that they would go to Toronto next year, this was overruled later in an executive session because of the after-thought that they should meet at some city reasonably close to paper mills that could be visited. So it was decided to hold it in either Montreal or Quebec wherever the accommodations for the dates--October 19 to 21, 1953—could be arranged.

There was considerable discussion of a plan to go to the Pacific Coast, preferably Portland, Ore. in 1954, but the present consensus on that proposal was against going that year, immediately after the first meeting in Canada for fear that two successive meetings away from the East and Midwest centers might lose too many regular delegates and break up the continuity of committee work.

Because of the very nature of this Engineering Conference, in which members of the committee are so actively integrated into the work year after year, there is a great deal of genuine trepidation among the leaders as to the dangers of taking the meeting so far away that some participants would fall by the wayside—and never come back.

It seems pretty certain now that the 1954 meeting will be somewhere on the Eastern Seaboard, outside of New York City. Boston, Philadelphia, Buffalo, and Savannah already have been sites of previous meetings in that area.

What to do about the Pacific Coast engineers, therefore, remains an unsolved problem. One line of thought, to which quite a few adhere, is that a parallel organization of engineers should be formed on the Pacific Coast, a group that would go deeper into their problems that they are able to do now in the annual Coast Section's Engineering Conference—carrying through special projects year after year in the way that the national group of engineers are doing. The South presents no such problem. Their delegates came in comparatively large numbers to the Chicago session. One obvious trend was that the bulk of the engineers from the mills came from the larger companies which have, as a rule, sizeable engineering divisions.

DIGESTER CORROSION

PROGRESS AS REPORTED AT CHICAGO

By James R. Lientz

Manager, Pulp & Paper Div., Union Bag & Paper Corp.; Chairman, TAPPI Chem. Engineering Committee

JAMES R. LIENTZ (in picture), who wrote this review and progress report on the kraft digester corrosion problem—one of the most serious of all problems facing the industry today—is well qualified for his authorship. In this article especially written for PULP & PAPER *readers he reviews the corrosion reports and sessions at the Chicago Engineering Conference, where he was Chairman of the sessions because of his position as Chairman of TAPPI's Chemical Engineering Division.*

Mr. Lientz is manager of the Pulp and Paper Division of Union Bag & Paper Corp., Savannah, Ga., where the greatest plant scale experiments in kraft digester construction and linings are being carried out. He discusses the experiments at Savannah.

Born in Los Angeles, he grew up in Kansas City and he went to the University of Michigan where he obtained his bachelor and master's degrees, the latter in chem. eng. in 1937. He was with Swenson Evaporator Co. in Chicago from 1937-40, then went to Union Bag as chief chemist, 1940-42. Returning to Swenson, 1942-46, he was manager of Swenson's pulp and paper dept. when he left there to return to Savannah. He was general superintendent at Union Bag until April of this year when he became manager of the entire Pulp and Paper Division.

The present status of the problem of corrosion of digesters in alkaline pulp mills was discussed at considerable length at the Seventh Annual TAPPI Engineering Conference in Chicago on Oct. 13-16. This subject has been studied extensively for the past two and one-half years by the Digester Corrosion Sub-Committee of the TAPPI chemical Engineering Committee. Because of the urgency of the problem and the great interest shown by mill engineers and operating personnel, it has become customary to present the latest available data on digester corrosion at the Engineering Conference each year.

This year particular attention was given to the discussion of techniques recommended by the committee for the measuring and reporting of corrosion rates in individual digesters in order that all mills might obtain uniform data for further study. The digester inspection report sheet recently published in TAPPI (Vol. 35 No. 136A-137A, July, 1952) was carefully analyzed and recommended for use by all interested mills.

To provide a publicized method for analysis of the data obtained, a paper entitled *Digester Corrosion Measurement* was presented by Nicholas Shoumatoff of West Virginia Pulp and Paper Co., who

THE AUTHOR—JAMES R. LIENTZ, Manager of the Pulp & Paper Div., Union Bag & Paper Corp., Savannah, Ga. This is a special report for PULP & PAPER readers.

was appointed chairman of the Digester Corrosion Sub-Committee during the meeting. Mr. Shoumatoff's paper presented data on the sequential wall thickness measurement of a digester at Luke, Maryland with particular emphasis on the quantitative analysis of the figures as an illustration of the study of corrosion in a typical sulphate pulp digester. This outstanding work is considered a valuable basic contribution of the study of this problem. In the discussion which followed this presentation, it was pointed out that the Audigage and similar instruments commonly used to measure digester wall thickness must be carefully calibrated and used with care by trained operators. Under these conditions, the Audigage, particularly, was recommended as a powerful tool for use in determining corrosion rate data. Also as an aid in safety control.

A point of interest to mill engineers was a discussion of the technique of obtaining individual wall thickness measurements at exactly the same position on each inspection through the use of a series of washers on a chain hung from special supports at the top of the digester.

It was observed that two companies are using different confidence levels in use of the Audigage. In response to a question by a boiler man, it was brought out that chemical and mill scale affect the readings).

During the session it was emphasized that the initial objectives of the committee were to bring the general problem of digester corrosion to the attention of mill managements and to provide methods of determining the extent of the problem in individual mills. The committee believes these purposes have been accomplished. From the longer range viewpoint, the committee further plans to publicize experience of American mills and to eventually provide help in reducing the problem by recommending steps which might be taken to improve the life of existing or replacement digesters. An important preliminary step in this direction was taken many months ago with the preparation of a comprehensive questionnaire to all American mills. The information obtained was summarized for the committee by the Batelle Memorial Institute as a project sponsored and financed by TAPPI. The report (TAPPI, Vol. 35, No. 9) was reviewed by H. O. Teeple, secretary of the Corrosion Committee at the Engineering Conference.

A further important part of the committee activities was to develop satisfactory procedures for co-operation and interchange of information between the various groups studying the problem in the United States, Canada, Sweden, and other countries. This has been successfully organized.

Field Lining Not Advised

Of great interest to mill personnel was the discussion session which brought to light up-to-date experiences concerning corrosion with alloys as well as problems concerning maintenance and repair of existing digesters. With regard to field lining of digesters, it developed that this procedure was not always dependable and, in general, could not be recommended as an economical or safe means for prolonging the life of a vessel.

Incidentally, one Southwestern mill and one Lake States mill reported contrasting experiences after carrying out the same procedures in field repair).

Some work has been done with overlay welding, using welding rod similar to type 310. This technique will be the subject of a paper to be presented within the next year through the Corrosion Committee.

(First overlays of welding rod were reported installed at an Eastern mill Jan. 19, 1951, starting with 25 lbs. of weld rod and, after examinations, increased eventually to 2,000 lbs. It was said to have paid for itself in saving an old digester).

While it is still too early to draw conclusions, it appears that corrosion is being experienced in digesters fabricated of alloy clad steel plates of the stainless types. This is very serious in at least one Southern mill. It appears, however, that Inconel clad digesters now offer considerable promise. Carbon brick-lined digesters also seem to have good possibilities in many cases. One mill reported that digesters which had been shop-lined with stainless steel and Inconel had been removed due to lining failures.

It was generally agreed that the present trend in the selection of new digesters was toward very thick carbon steel units with th maximum corrosion allowance obtainable. Various types of steel have been considered, but A-285 grade C and A-285 grade B seemed to be most usually selected.

At the breakfast and luncheon meetings of the Digester Corrosion Committee, attended by 95% of the entire committee,

CORROSION—EXPERTS AND CONFEREES

ONE OF HIGHLIGHTS OF CHICAGO was kraft digester corrosion session. Here are a few of participants—including men devoting much of their time to trying to find solution for this costly problem. (Top row—l to r): **NICHOLAS SHOUMATOFF**, New York-born Process Engineer for West Virginia, Chairman of Corrosion Sub-Committee, who gave paper on use of Audigage for digester thickness readings at Luke Mill and its development as an instrument for safety and research; **LOUIS DELAGRANGE**, Engineering Dept., West Virginia, New York, who collaborated with Mr. Shoumatoff; **WM. J. DARMSTADT**, Asst. to Frank Hutton, Babcock & Wilcox, member of Corrosion Committee, who inquired about scaling problems; **E. F. TUCKER**, President of Stebbins, attacking the problem with brick linings improvements; **RICHARD CHASE**, Asst. Supt., Tech. Dept., Union Bag, where a variety of digester types are being tried in plant-scale experiment; and **H. O. TEEPLE**, of Inco, Secy. of the Committee. (Below, left to right): **JACK WILCOX**, Mgr., Process Equipment Div., Electric Steel Foundry Co., Portland, Ore., whose interest involves circulating systems, studies in alloys, etc.; **STEVE BAISCH**, Design Engineer, Thilmany Pulp & Paper, who told of overlaying work done in patching digester at his mill; **WM. J. SHELTON**, Supt. Pulp & Paper Mfg., Longview Fibre Co., Longview, Wash., Corrosion Committeeman; **ROBERT A. DAVIS**, Birmingham, Ala., District Engineer for Chicago Bridge; and **HENRY SCHMITZ JR.**, veteran digester specialist for A. O. Smith Corp., Milwaukee. Merrill Scheill, who heads up research in this field for A. O. Smith, is that company's member of Committee, but was unable to attend. Scott Henry served in his place.

on Oct. 14, plans were made for a number of papers to be presented at the Feb. and Oct., 1953, meetings of TAPPI. All of these plans are in line with the objective of continuing, to keep up-to-date experience available to the mills at all times. Members of the committee are:

Nicholas Shoumatoff (Chairman), West Virginia Pulp & Paper Co.; H. O. Teeple (Secretary), International Nickel Co.; S. J. Baisch, Thilmany Pulp & Paper Co.; J. J. Goss, Gaylord Container Corp., J. R. Lientz, Union Bag & Paper Corp.; F. W. Flynn, Crown Zellerbach Corp.; E. W. Keith; Penobscot Chemical Fibre Co.; W. J. Shelton; Longview Fibre Co.; Wayne Smith, Crossett Paper Mills; L. W. Williams, Lukens Steel Co.; E. W. Hopper, Crucible Steel Co. of America; Merrill A. Scheill, A. O. Smith Corp.; Beaumont Thomas, Stebbins Engineering & Mfg. Co.; Roy P. Whitney, Institute of Paper Chemistry; Rod A. Davis, Chicago Bridge & Iron Co.; Frank E. Hutton, The Babcock & Wilcox Co., and H. M. Spring Mutual Boiler Insurance Co.

THE COATING PATENT CASE

Judge Robert E. Tehan, U. S. District Court, Eastern District of Wisconsin, Milwaukee, on Oct. 13 handed down a written opinion in the case of Consolidated Water Power & Paper Co. and Peter J. Massey vs Kimberly-Clark Corp., holding that the Massey original machine-coating patent No. 1921368 has not been infringed by Kimberly-Clark and that claims of this patent are invalid. The patent expired Aug. 8, 1950.

Consolidated, which filed a notice of appeal to the U. S. Circuit Court of Appeals for the 7th Circuit, stated that it hopes to have a decision from that court before next summer.

Judge Tehan's written opinion was merely an enlargement and an elaboration of memorandum decision of May 29.

Consolidated's subsequent coating patents relating to machinery, coating composition, etc., are not affected. For that matter, various patents on coating processes of others including Kimberly-Clark are still effective and not involved.

As explained in PULP & PAPER in Aug. 1952 issue, this case only affects Kimberly-Clark and Consolidated and not any others in the field or any of the processes now in use. Its consequence could be only a possible payment of money by K-C to Consolidated and then, of course, only if the decisions of Judge Tehan were reversed.

CHICAGO MOVIE SCENE

THIS STILL from the movie which International Nickel presented at Corrosion Session in Chicago shows ravages of corrosion that occurred under washers holding a tin plate. The alloy has lost its passivity in the attacked edges. It is unattacked in other areas where it is still passive.

International Nickel Movie on Corrosion

A feature of the corrosion session in Chicago was International Nickel's movie on "Corrosion in Action." What it brought out chiefly was that a certain alloy may retain passivity in certain relationships and conditions but lose it in others.

The scenes dealt with passivity and protective films. The passivation of iron by exposure to concentrated nitric acid was demonstrated. It showed the frailty of this kind of passivity and led to a demonstration of how the addition of chromium and nickel to iron provides a much more stable passivity. The potential relationships that exist between iron and stainless steels in their active and passive states were demonstrated. The importance of avoiding local shielding of stainless steel surfaces so as to induce local loss of passivity was illustrated and practical examples of damage that results from these effects.

Canadian Report On Digester Corrosion

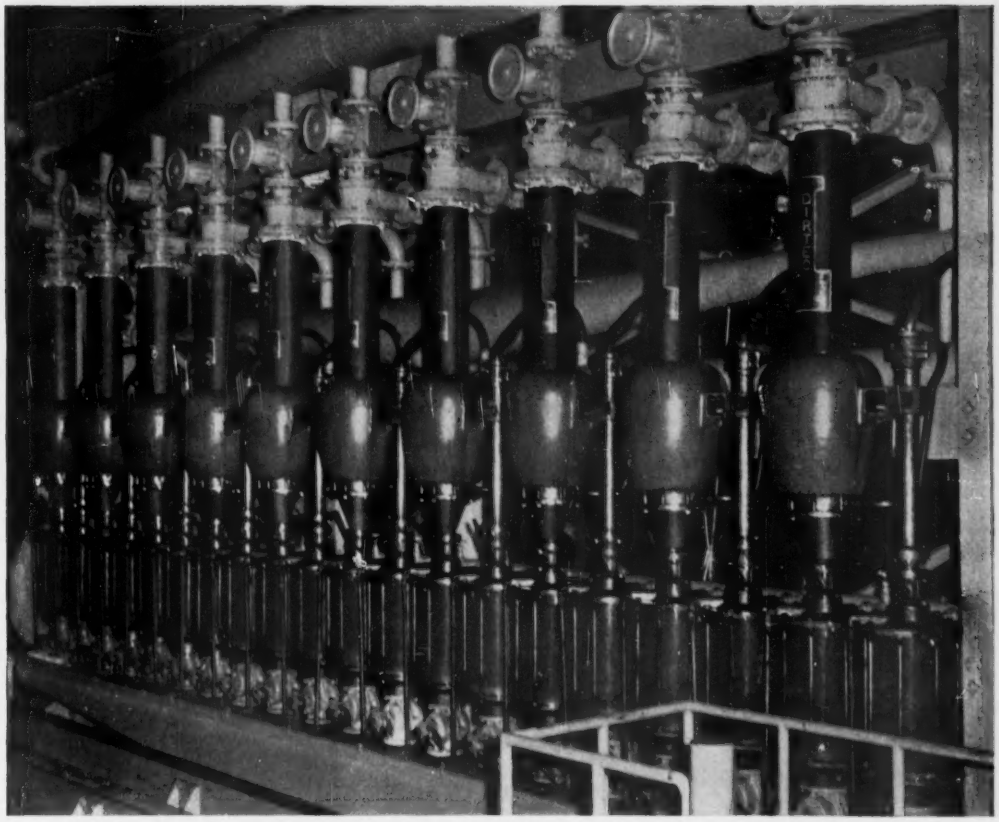
At the Chicago Engineering Conference, a Canadian representative gave an informal report on progress of investigations in that country, and answered some questions about it.

This brought out that the Canadian "task force" has already visited over half of the kraft mills in Canada to get data. They have found similarity in experiences. However, highest rate of corrosion in Canada is found in the middle part of digesters; in the U. S. mills it is usually in the dome area. Use of circulation systems may partly explain this.

Arthur D. Little of Boston is analyzing the Canadian data. The Canadians expect in a short time to determine whether it would be worthwhile to study the possible values of coatings. Incidentally, the Canadian industry has made its inquiries into mills compulsory; in the U. S. the job is being done on a voluntary basis.

Kimberly-Clark Guest House

Kimberly-Clark Coro. has begun contruction of a new guest house for the company, to be built at cost of $45,000 on North Lake St. in Menasha, Wis.



DIRTECS AT DETROIT

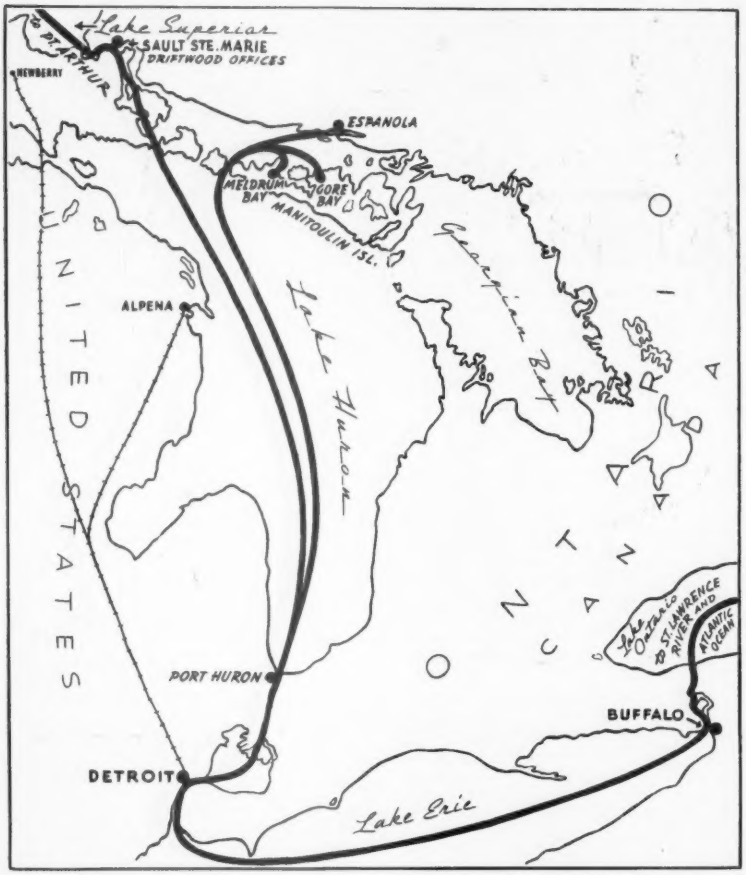
Detroit Sulphite Pulp & Paper Company's new No. 9 paper machine is fed uniformly clean stock by this battery of Dirtecs. A duplicate of this up-to-the-minute installation is going on No. 10 machine. Dirtec Bulletin mailed on request.

Also on No. 9 is a *Bird Save-All* and a *Vickery Felt Conditioner* equipped with four Jordan type vacuum boxes and operating on the *bottom felt* — this after the mill's successful experience with bottom felt Vickery Conditioning on their No. 7 machine. For full information on this interesting conditioner application get in touch with

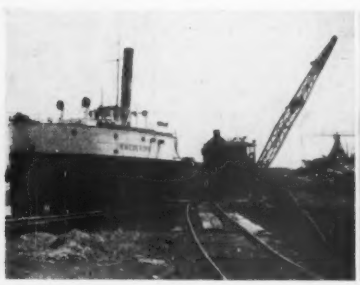
BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

DETROIT SULPHITE PULP & PAPER CO.

MILL IN A GREAT CITY



THIS MAP SHOWS HOW PULPWOOD is transported to Detroit Sulphite Pulp & Paper Co. in the metropolis of Detroit. Note some wood barges are towed 1600 miles, from as far away as Prince Edward Island. This map is too small to show that haul, or the hauls from Port Arthur and Thunder Bay on Lake Superior. Port Arthur tows are about 700 miles; from Michipicoten Harbor, 600 miles. In 1953 some wood will come from the Northern Peninsula of Michigan, from Newberry. Wood has even come from Alpena region in the Southern Peninsula. These last two are railroad hauls.



DETROIT SULPHITE'S Barge "Swederope" was being unloaded when PULP & PAPER editor visited mill and got this picture.

NEW OHIO LOCOMOTIVE Diesel crane is dumping wood from a ship in yard with Link Belt grapple.

Unique among the world's pulp and paper mills is Detroit Sulphite Pulp & Paper Co.

Where else in a great metropolitan center of 3,000,000 population can be found such an industry, with its sulfur pile and its mountain of 50,000 cords of wood, its woodroom, its sulfite mill and paper mill, —plus extensive converting operations making high-grade, light-weight specialties—all within the city limits of Detroit?

The mill is on the River Rouge, the same river on which the great Ford industry is located. It is a full half-mile inside the southern city limits of Detroit and is a familiar sight on the highways leading south from that city. When the Indian fighter Cadillac founded this city 251 years ago, the River Rouge was flowing north past the present location of this mill, paralleling the Detroit River. Past the mill site, the Rouge cut east and joined the Detroit.

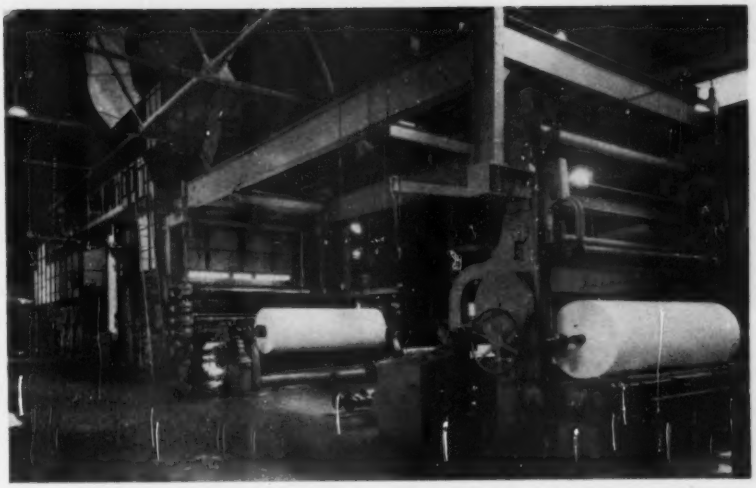
But along came a time when Henry Ford decided to take a shortcut into the Detroit River by cutting a canal connecting the Rouge and the Detroit Rivers some distance south of the mill. As a result, the River Rouge, where it passes the Detroit Sulphite Pulp & Paper Co., is running in an opposite direction to its historic course. It runs up its former course to the canal from the Detroit and empties back into it.

Here the Detroit carries the tremendous volume from Lake Superior, Lake Huron, and Lake Michigan, down through its narrow passage into Lake Erie and on through the St. Lawrence River to the Atlantic Ocean. Sometimes, despite the canal, the River Rouge reverses its course here beside the mill—spring freshet conditions may influence it.

The paper company has its own barges and tug, as well as other chartered boats which bring pulpwood supplies from the head of the lakes and even as far away as Prince Edward Island, in Atlantic waters—a 1,600-mile haul right up to the mill door.

From its own ownership in excess of 1,000,000 cords of virgin spruce in Ontario regions and other areas where it holds cutting rights of considerable extent, and from contracts to purchase wood, the Detroit mill is assured of a perpetual supply of wood for its operations, strategically located for these hauls despite the fact that it is right in the heart of a large metropolis.

Detroit Sulphite is an unusual mill because it makes about 200 different grades of light-weight sulfite specialties. Although none of these is sold under its own brand name, many well-known paper products are made from the mill's paper. Decorative commercial wrapping papers, coated and colored novelties, printing products, and even some novelty bags are included in



GENERAL VIEW OF NO. 9 PAPER MACHINE at Detroit Sulphite Pulp & Paper Co. It is 136-in. Beloit Fourdrinier with Yankee and pre-dryers and Beloit 2-drum winder. Reliance Electric & Engineering Co. supplied electrical panels, motor generator sets driving main line shaft, couch helper, main press helper and winder drive. Hood and air system by Ross Engineering.

the daily paper mill production of about 150 tons. Many food-protection papers, well known to the American consumer as well as consumers in other countries, emanate from this mill.

Across the familiar Zug Island from the mill, many ships are passing every day—several hundred a day in the summer months—going to and from Great Lakes ports, headed for the ocean. It was here, in 1884, that one of the first sulfite pulp mills in the world was built. Ole Mitschlerich, of Germany, who came to the United States as an engineer with his Mitschlerich sulfite process, built the mills in Michigan which use that process. They were located at Detroit, Port Huron, and Alpena. Only one, the Detroit mill, is still in existence. It is an interesting and strange sidelight that some of the wood for this mill comes from around Alpena, where one of the other pulp mills has ceased to function.

Wood Supply

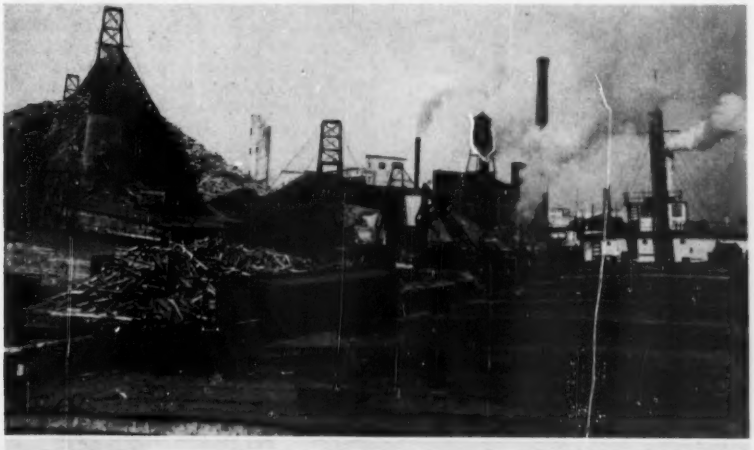
A map accompanying this article shows the sources of wood supply and the routes taken by the big pulpwood barges and their tugs. In northern Ontario the company has in excess of 1,000,000 cords of virgin spruce. The operating company for its own holdings is Driftwood Lands and Timber, Ltd., with headquarters at Sault Ste. Marie, Ontario. This is a fully-owned subsidiary. It obtains its name "Driftwood" from a river on which some of the principal holdings are located. These are in the Cochrane area, and other nearby areas in Ontario.

The company also has extensive cutting rights on the Brunswick House Indian Reserve areas of Ontario. The purchased wood comes from as far as Prince Edward Island, New Brunswick, Quebec, and from Thunder Bay on Lake Superior.

The mill uses 100,000 cords of pulpwood a year. Half of this amount is carried in its three fully-owned barges. All three of these barges are kept in continuous operation during the navigation season. While one barge is being loaded on Lake Superior another is at Detroit unloading, and the third is on its way to one or the other point with the company's tug. Each of these barges carries 2,500 cords. Tows are up to 700 miles from Port Arthur in Lake Superior, perhaps around 600 miles to Michipicoten Harbor, and somewhat less to Manitoulin Island in Lake Huron. The haul from Prince Edward Island is about 1,600 miles. In Ontario, wood is driven on the river to rail loading points and then hauled in pulpwood cars to harbors equipped for pulpwood loading.

About 5,000 cords a year are still being obtained from the Alpena region in Southern Michigan. While there has been no wood brought in from the Upper Peninsula this year, shipment from that section is to be resumed next year with four or five thousand cords coming from the Newberry area. All of this Michigan wood is brought to the mill by rail.

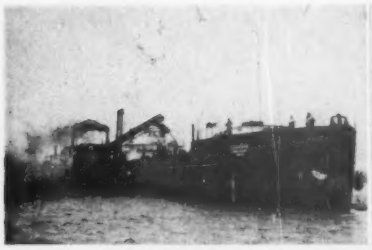
George N. Carleton, president of Detroit Sulphite Pulp & Paper Co. since January,



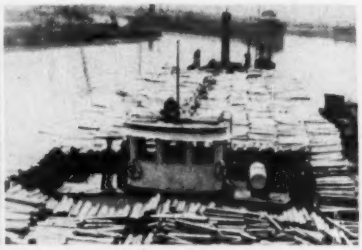
ABOVE IS GENERAL VIEW of Detroit Sulphite's unusual overhead conveyor system in its woodyard, taken from deck of a barge. At right rear is Mill's Power Plant. Note Jenssen tower beyond wood pile. Overhead system is for unloading wood from barges to big yard—a phenomenon of the great City of Detroit, where up to 50,000 cords are piled.

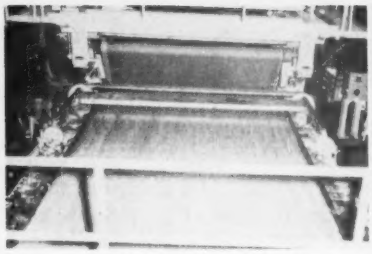
WAY DOWN IN MIDDLE of woodpile (in lower picture) is Manitowoc crane of crawler speed type feeding wood into return conveyor for Detroit Sulphite Mill. Note unusual suspension type conveyor which feeds into wood yard. Under overhead conveyor in distance can be seen U. S. Gypsum's River Rouge plant. Note in foreground, the wood "fence" neatly stacked to hold loose piles in bounds.

DETROIT SULPHITE'S Pulpwood Barge "Cordova" being loaded at Nipigon, Ontario.

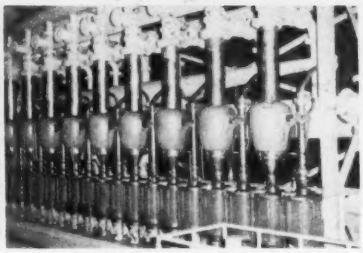


LOOKING DOWN upon a barge-load of wood at Detroit Mill dock. This mill uses 100,000 cords a year.





LOOKING DOWN on wire of No. 9 Beloit 136 in. Fourdrinier machine at Detroit Sulphite Pulp & Paper Co.



BATTERY OF BIRD MACHINE CO. Dirtecs, used for removing dirt from stock ahead of Detroit Sulphite's No. 9 machine.

1944, and a director, was first employed by the company in the pulpwood department in 1927. Before coming to Detroit in 1930, he supervised various pulpwood operations in Ontario. Prior to becoming president he had been in a supervisory capacity in most of the operating departments, eventually becoming general superintendent and vice-president in 1943. He was born in East Tawas, Michigan and attended the University of Michigan.

Colonel Harry S. Hamilton, of Sault Ste. Marie, Ontario, an attorney, is the president of Driftwood Lands and Timber, Limited and Mr. Carleton is vice president. Russell A. Mills is secretary-treasurer of both companies. W. H. Nasi, who has been with the corporation for 25 years, is general operating manager in Ontario. The entire supervising personnel staff there are Canadians, and the company's vessels are of British foreign register.

Two New Machines

As for the mill in Detroit, there are many interesting aspects about it. Particularly noteworthy is the new No. 9 (actually sixth in operation) paper machine, a combination Yankee-Fourdrinier. This machine now is virtually duplicated by another (No. 10). As this issue goes to press, erection of No. 10 was being completed at the Detroit mill and its staff were making ready for its start-up. The description of No. 9 machine, in operation since Feb. 1951, which will follow, is therefore virtually also the description of No. 10.

Some improvements have been made in the wood-preparation department of the mill, as well as changes in the pulp mill. There have also been a great many additions and improvements in the converting department.

What they are most proud of at Detroit Sulphite is that of their 500 employes, a total of 111 have over 20 years of service in the company. As an example, Mark L. Ashby, head of the shipping department, has been with the company for over 50 years. The mill operates on a 48-hour week, and it has two A. F. of L. unions.

Wood Yard

In its wood yard are seen the huge piles of spruce and balsam, in a wide range of diameters, from 3½ to 24 inches. The average is about 5½ inches. There are three locomotive cranes, one a new Ohio Diesel and two Link-Belts. Usually two are unloading pulpwood vessels while the third is working in the yard.

Owen grapples are being used for 4-foot wood, and these can handle ⅝ cord in one scoop. There are also Link-Belt wood grabs for use on 8-foot wood and some 4-foot wood. These will handle a cord of 8-foot wood. The barges carry 2,200 to 2,500 cords each, the barges themselves being 4,000- to 5,000-ton boats. The wood may be unloaded in 8-foot lengths, and if so is slashed to 4-foot lengths while being unloaded.

There is an unusual suspension conveyor and a return submerged conveyor line in Detroit Sulphite's woodyard believed to be unique in many respects in this industry. The wood is carried up on a high suspension-type conveyor and dropped in a random pile, which may be built up to an 80-foot height. It is then retrieved when wanted with crawler cranes of the Manitowac speed type equipped with ½-cord grapples and returned to the woodroom via the submerged return conveyor. At a transfer point another suspension conveyor of the same type carries the wood to the woodroom. It is possible for the overhead conveyor to be operating at the same time as the crawler cranes are retrieving the wood and throwing it into the return line in the ditch.

This woodyard storage pile of 50,000 cords is all under the suspension conveyor. The ditch is a concrete one, with steel wearing plates for the conveyor. In order to put more wood on the piles than would be possible otherwise, high-pressure sluicing is used, thereby decreasing the "degree of repose" for the wood. This sluicing is done at 300 gpm. per nozzle and 90 p.s.i.

In order to minimize the pitch problem prevalent in most sulfite mills, only seasoned wood is used in the daily manufacture of pulp. Consequently it is necessary to re-handle the entire woodyard annually. This way, the mill is using the oldest wood at all times, thereby reducing the

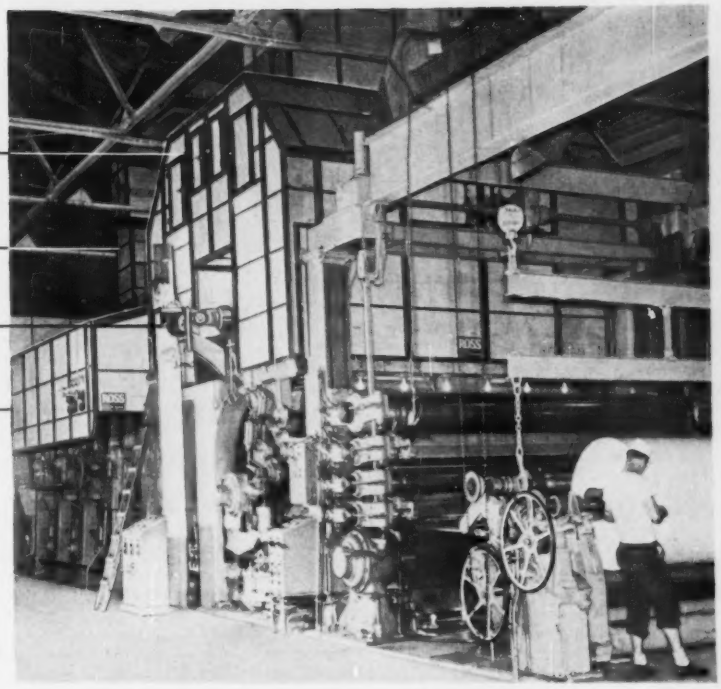
CLOSER VIEW OF NO. 9 BELOIT YANKEE FOURDRINIER at Detroit Sulphite Pulp & Paper Co., showing Ross Engineering Corp. hood and air system. This Ross system is supplied for pre-dryers which feature this machine, as well as Yankee.

Doors permit access to the Yankee Dryer inside the hood

Exhaust stack is of telescopic design to permit passage of crane up to Yankee Dryer area

Yankee Dryer bearings are located outside the dryer hood

Hood and exhaust system over predryers just ahead of Yankee Dryer



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the finest in air handling equipment

In keeping with the high standard of efficiency required of all equipment installed for DETROIT SULPHITE PULP & PAPER COMPANY, the ROSS Yankee Machine Hood and Air System embodies the newest features in design and operation. In addition to the features pointed out above the ROSS Air System, which is of the recirculating design, has a damper arrangement to permit adjusting the amount of recirculated and fresh air handled through the system.

We are justly proud of the important part assigned to ROSS Systems by DETROIT SULPHITE PULP & PAPER COMPANY—another of the industry's outstanding manufacturers.

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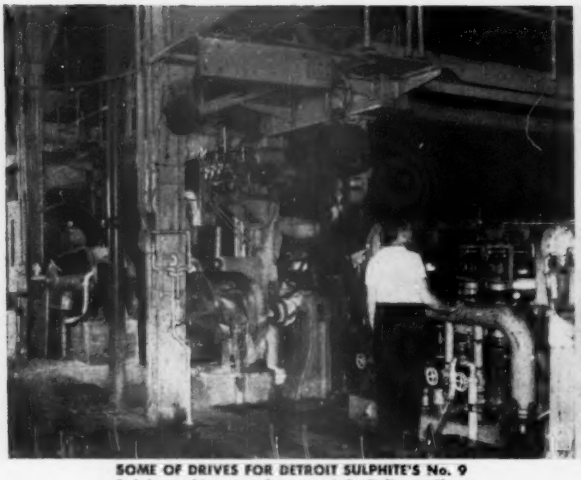
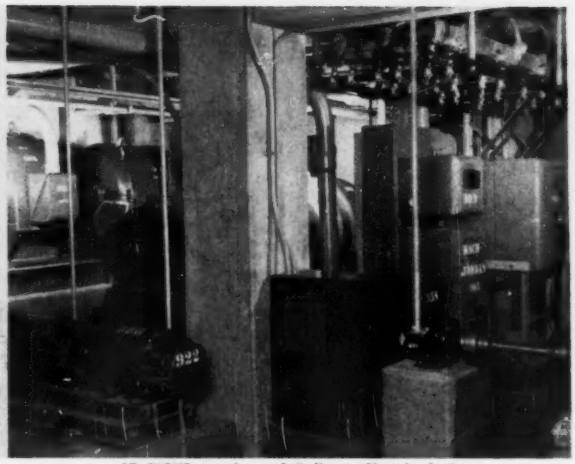


SOME OF DRIVES FOR DETROIT SULPHITE'S No. 9 Beloit machine are shown at left. Reliance Electric & Manufacturing Co.'s motor and drive system with helper drives, is notable for compactness, speed regulation.



AT RIGHT, a view of Reliance Electric & Engineering's motor generator sets for No. 9 Machine in basement electric room.

pitch and minimizing deterioration of the wood.

Wood Preparation

The wood drops into the wood-preparation plant through a chute onto a conveyor and gates direct it to two barking drums, or to a storage pond, or to an Allis-Chalmers Streambarker, as is desired. There are two barkers, one a D. J. Murray, the other a new Fibre-Making Processes, Inc. M-Bar 12x45 ft. drum barker.

The chipper is a new Carthage 10-knife unit with a 19-inch spout and 88-inch diameter disc. An Electric Machinery Mfg. Co. 600-hp. 60-cycle 3-phase synchronous motor drives the chipper. There is a spare chipper for use during knife changes. These are followed by two new Allis-Chalmers low head vibrating screens and one older Simplicity screen. A D. J. Murray rechipper, hammer-type, salvages the oversize chips.

The Pulp Mill

In the pulp mill are 8 horizontal Mitschlerich digesters, 12 x 45 feet, of 12-ton capacity each. One of the things that was done here in postwar years was to change all of the fittings from bronze to stainless steel. Powell valves and fittings are used in the digester house. A great deal of recent modernizing stainless work was done by Michigan Steel Casting Co. The result has been a lowering of maintenance costs.

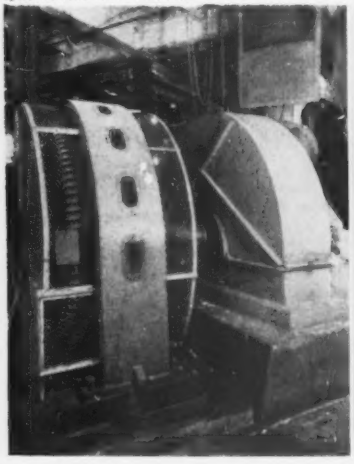
A practice that has alleviated a disagreeable task at Detroit Sulphite is washing out the digester with a dumping nozzle of the Monitor log pile type, the nozzle feed being at 1,000 gpm's. In this way, workers do not have to go into the digester.

The digesters were all lined by Stebbins Engineering and Mfg. Co. The pulp mill equipment following the digesters is pretty much standard and conventional and has been in use for some time, including Packer screens and Impco deckers. But there are some fairly new installations here. One is a Dilts stock drubber before the knotters, which breaks up the bundles of stock to facilitate screening. One of the first such installations was put into this mill. There are also two Bauer double-disc refiners of fairly recent date. One is used on refining screenings, and the other has an interesting application on sulfite stock prior to bleaching. The former is a Bauer Model No. 187 of 24 inches, and the other is a Model No. 185 of 36 inches.

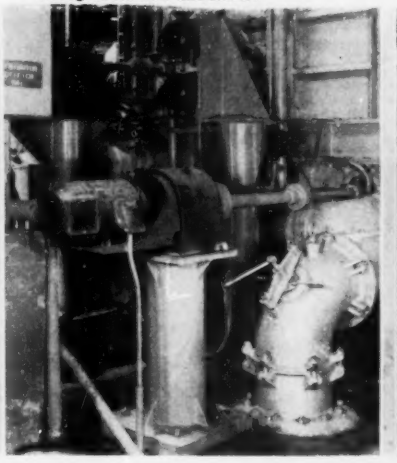
Pulp production in this mill is about 150 tons a day and just about equals its paper production. About 80 percent of the stock is pre-heated indirectly by means of a new Venturi-type Woodward heater and bleached in a one-stage Bellmer hypochlorite bleach plant. Slush stock of 5 percent consistency is pumped through 14 in. pipe lines to feed the battery of 23 E. D. Jones & Sons and Horne beaters still serving well.

(Continued on page 42)

NEW CARTHAGE 10-knife Chipper in Detroit Sulphite Pulp & Paper is being driven by Electric Machinery 600 hp. 60-cycle three-phase synchronous motor on left.



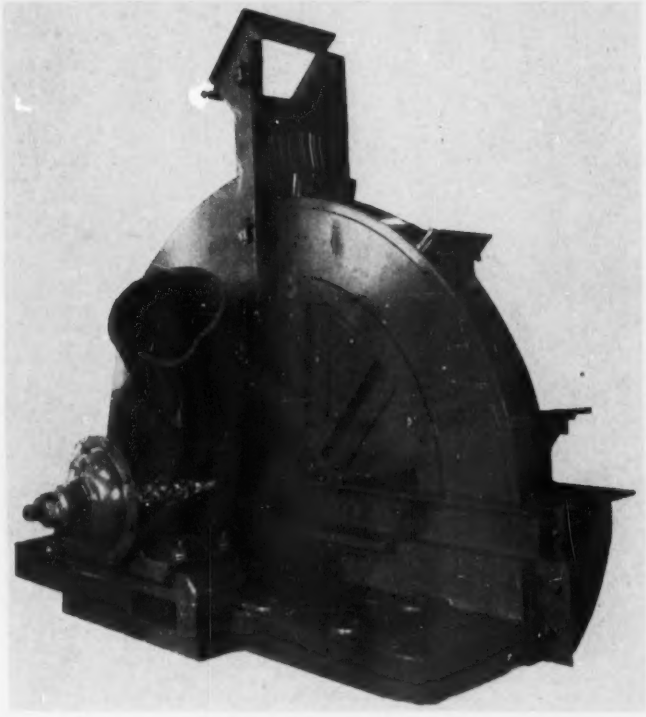
AGITATION DRIVE on No. 9 Machine Pressurized Headbox with Beloit air-cushioned inlet at Detroit mill. Stock passes through motor controlled stream flow valve and enters inlet through cross-flow distributor.



BACK SIDE of NO. 9 BELOIT YANKEE FOURDRINIER at Detroit Mill showing RELIANCE helper drives. In the back-left can be seen one of Beloit enclosed Hypoid gear units with air clutch. The belt leads to main drive shaft.

CARTHAGE MACHINE CO.

CARTHAGE, NEW YORK



This picture shows 3 features that make it possible for one knife to cut a log before the previous one leaves it. 1. Knives hooking logs in toward center. 2. Spout in close to shaft. 3. Floor of spout sloping toward center.

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CHIPPERS • CHIP SCREENS, ROTARY AND VIBRATING
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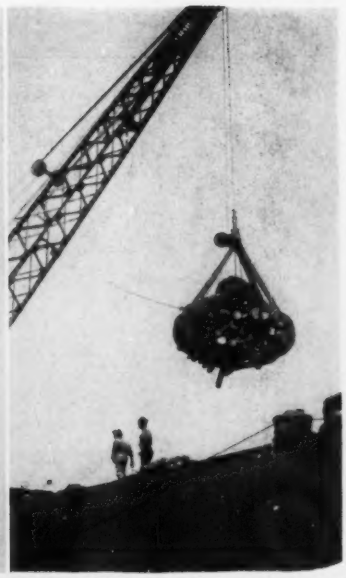
ONE OF OLDEST SULFITE mills in world, Detroit Sulphite's Jenssen Tower shown here with tanks, is a familiar landmark in the heart of that city 3,000,000 people.

RETURN SUBMERGED CONVEYOR system to mill, in the big wood yard right off Detroit's Sulphite Mill.



LINK-BELT GRAPPLE is used in unloading one of pulpwood barges making delivery to Detroit Mill's dock on River Rouge.

The Paper Machines

In the paper mill, of course, the objects of greatest attention to visitors are the new No. 9 and No. 10 machines, the latter to come into production around the end of 1952. They are 136-inch wide machines, with a speed of up to 1,800 f.p.m. In early June, No. 9 made a record production of 127,000 pounds of paper in one day. There are actually six paper machines in all in this mill. Three are Yankees, two are Combination Yankees, and one a Combination Yankee-Fourdrinier.

As for the other machines, the principal improvement is that a new 10-foot Yankee dryer was installed on No. 3 machine in 1949—this being an 84-inch trim machine. New Valley stainless steel headboxes and inlets were installed on No. 8 and No. 7 machines in recent years. The No. 9 machine is between the 132-inch No. 8 machine and the 96-inch No. 3 machine. No. 3 is the oldest machine now in operation. No. 8 goes back to the 1920's. But No. 3 has a new Reliance single motor drive.

For dirt removal, ahead of No. 9 paper machine are installed a battery of Dirtecs and also two Shartle Bros. Selectifier screens. For completion of stock treatment, a Jones Imperial Jordan is also installed ahead of the machine. All Monel piping, fabricated by Brown-Hutchinson Iron Works of Detroit, is used for major piping and flow lines ahead of the machines.

Description of New Paper Machines

Both No. 9 and No. 10 machines have the patented Beloit air-cushioned inlet to assure a level sheet of high quality. Stock passes through a motor controlled Beloit stream flow valve and enters the inlet through a cross-flow distributor for even distribution of fibers. Stock level in the inlet itself is automatically kept at a constant level by partial vacuum or by air pressure (depending upon machine speed), with a single Nash Engineering compressor to supply vacuum or pressure as needed. However, operators adjust the volume of flow and height of slice opening in the same way that they would for an open headbox. And indicator shows the same "head" that would exist in an open headbox at the same operating speed.

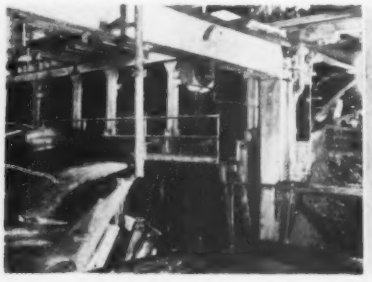
Because stock level in the inlet is the same at all machine speeds, the system of self-cleaning rectifier rolls maintains even distribution of fibers while the stock flows cleanly and smoothly through the inlet.

Almost all points for stock accumulation are eliminated, and there is also an efficient shower system inside the inlet. As a result, the inlet can be operated over long periods of time without special clean-ups.

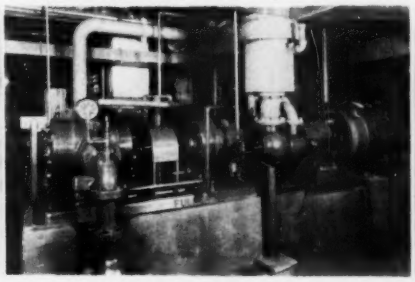
Both new paper machines have a Fourdrinier section of latest Beloit design. Stainless steel, brass, rubber and other materials are used to provide protection against corrosion. Beloit stainless steel suction boxes, provided with motor-driven oscillation, and a high speed super-shake unit are among the features of the Fourdrinier.

A rubber-covered top couch roll is used to pick the sheet from the wire as it passes over a grooved bottom couch roll. The sheet then passes through a suction main press (28-inch patented Beloit heavy duty suction press roll and top roll of 26-inch diameter) and a suction transfer

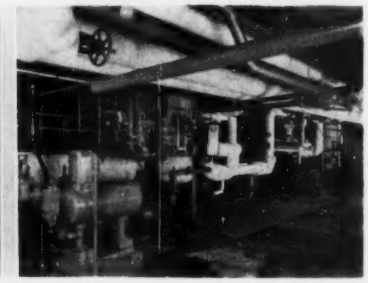
FIBRE-MAKING PROCESSES, INC., supplied a new M-Bar 12 by 45 ft. drum barker for Detroit Mill wood room modernization.

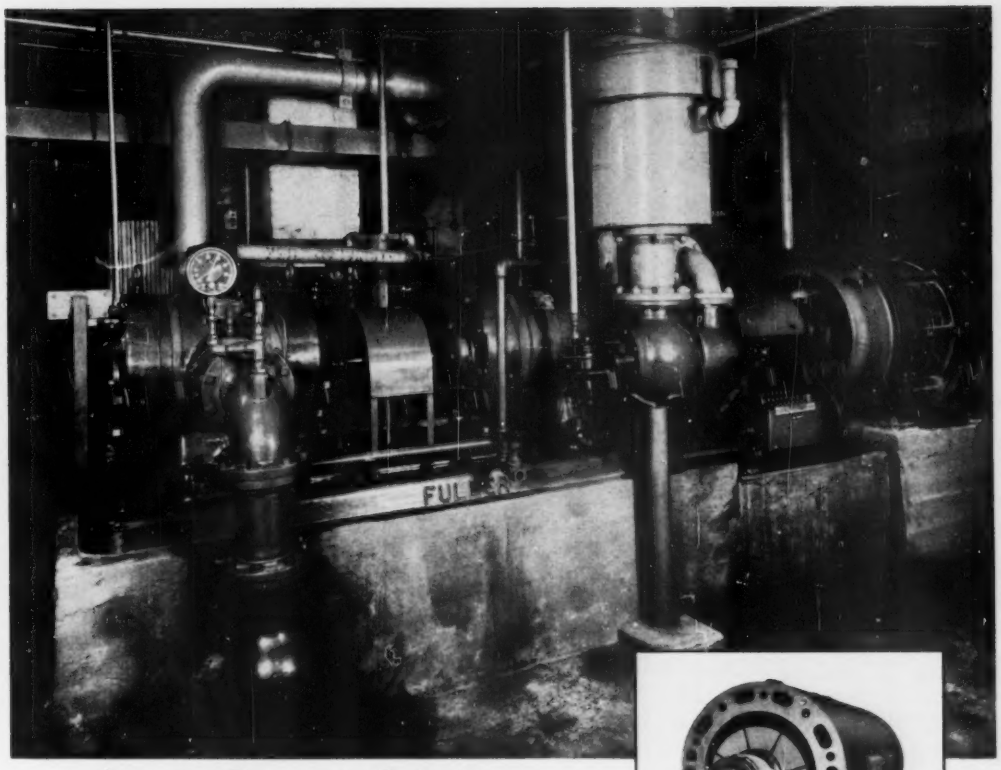


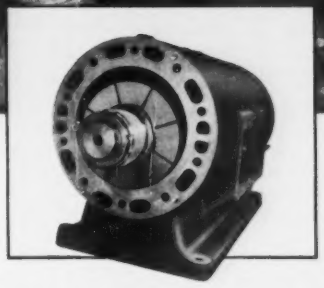
FULLER CO. of Catasaqua, Pa., provided this rotary two stage 772 c.f.m. capacity (at 80 lbs. pressure) Air Compressor with Reliance Electric & Engineering drive at right.



MIDWEST-FULTON Condensate Removal system shown here below new No. 9 Machine, and Thermo Compressors aid in balancing 28 lb. and 150 lb. steam demand at Detroit Mill.







Air at Detroit Sulphite
supplied by a
FULLER ROTARY COMPRESSOR

One of the most unique and interesting pulp and paper mills in the country, that of the Detroit Sulphite Pulp and Paper Company, Detroit, Michigan, uses a Fuller Rotary Two-stage Compressor to supply most of the air required for its many operations. This machine, shown above, has a capacity of 772 c.f.m., at 80 pounds gage, actual free-air delivery.

Detroit Sulphite has joined no *small* family of users of Fuller Rotaries: food and chemical plants, steel mills, cement plants, refineries, automobile plants, and many others depend on the reliability of Fullers wherever air is required.

Fuller Compressors require minimum maintenance because only the rotor, blades, and bearings move. No valves to leak or seats to grind. Blades automatically compensate for wear, insuring maintained capacity for the life of the machine.

Whether your air-plans call for single-stage, two-stage—single-stage duplex or two-stage duplex—you can be sure Fuller has the compressors which gives you a dependable source of pulsation-free air up to 3300 c.f.m., 125-lb. per square inch pressure.

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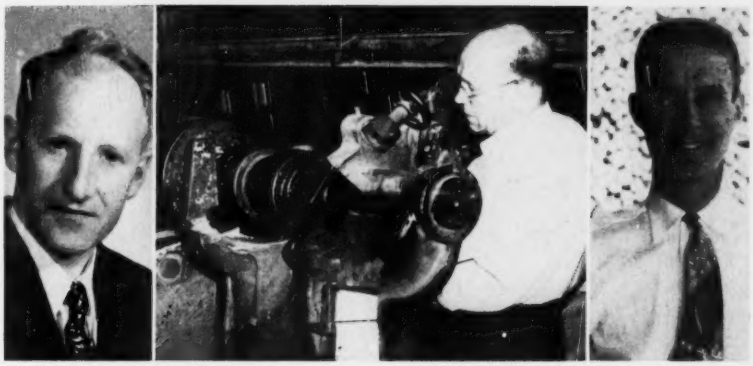
1935

PIONEERS OF HIGH-EFFICIENCY VANE-TYPE ROTARY COMPRESSORS

DR. ROY DAVIS (left), is Vice Pres. in Charge of Production and General Superintendent at Detroit Sulphite Pulp & Paper Co. KEN G. SELL (right), is Vice President in Charge of Sales. On our cover, this issue, is photograph of GEORGE N. CARLETON, President of the company, and a general view of the Detroit Mill.

MARK L. ASHBY, 50-Year Veteran in Detroit Sulphite employ. This mill has over 100 employes with 20 yrs. or more service.

DETROIT SULPHITE PULP & PAPER CO. executives and key personnel (l to r): R. A. MILLS, Secretary and Treasurer; MARTIN F. SCHNAUFER, Chief Engineer; W. A. STARK, Asst. Treasurer and Office Mgr.; DR. LESLIE L. LARSON, Tech. Director; B. C. JOHNSON, Pulp Mill Supt. and Woodyard Supt.; ED L. GIFFEN, Personnel and Industrial Relations Supervisor.



OTHER KEY MEN IN DETROIT SULPHITE'S STAFF (l to r): GORDON MORSETH, Asst. Gen. Supt.; LOUIS A. TWEET, Paper Mill Superintendent (picture taken as he was operating start-up of No. 9 Machine; and CHARLES G. ALLEN, head of Woods Dept. office at Detroit (appropriately with wood stack in background).

press (28-inch suction roll and 26-inch plain roll).

The sheet then goes to a pre-dryer section comprising ten high pressure 60 inch diameter paper dryers and two 60 inch felt dryers.

A pressure roll then applies the sheet to the 12-foot diameter Yankee dryer, which is followed by a five-roll open side calender stack with oscillating doctors. There is also a Beloit transfer reel.

Among features of the high-speed Beloit two-drum winder installed for each new machine are the motor-operated roll ejector, motor-driven rider roll with air-loading, hydraulic roll lowering table and shear-cut slitters.

Each of the two new machines has a Ross Engineering Corp. hood and air system for the Yankee dryer and the pre-dryers. Condensate removal is accomplished by a Midwest Fulton system and Thermo compressors aid in balancing 28-pound and 150-pound steam demand.

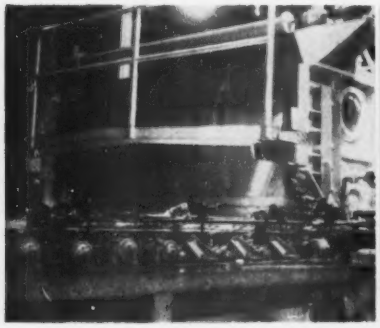
At the dry end is a Mason-Neilan board for all temperature and pressure controls at a centralized point beyond the Yankee. On this board are six temperature and pressure recorders and gauges—all by Mason Neilan except for one air temperature gauge.

In an electric room in the basement are No. 9's motor-generator sets supplied by Reliance Electric & Engineering Co. and all the Cutler-Hammer controls. The Reliance 450 H.P. alternating current motor drives a 300 KW direct current generator to supply the Reliance motor driving the main line shaft and the Reliance couch roll helper motor. The 150 H.P. alternating current motor drives two direct current generators, one for the Reliance winder drive and the other for the Reliance helper drive on the main press. The winder drive is a Type T direct current 50 H. P. motor of 230 volts. Reliance also supplied electrical panel boards for press and couch.

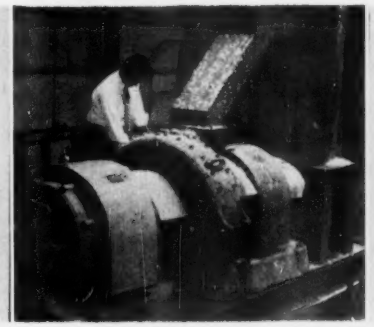
Most of the machine is driven by Beloit enclosed hypoid gear units, belt-powered from the main line shaft. These gear units, complete with air operated clutches and motor driven belt shifters, are provided for transfer press, pre-dryers, Yankee dryer, calender and reel.

Stowe-Woodward Co. Inc. supplied a total of three Microrok-covered and ten rubber-covered rolls in all for No. 9 machine, with rolls ranging from 18 to 28 in. diameter. For No. 10 machine Stowe-Woodward also provided most covered rolls. Cincinnati Rubber provided some felt rolls for both machines.

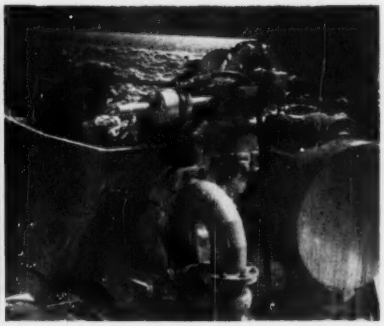
The big fan pump for No. 9 is an Allis-



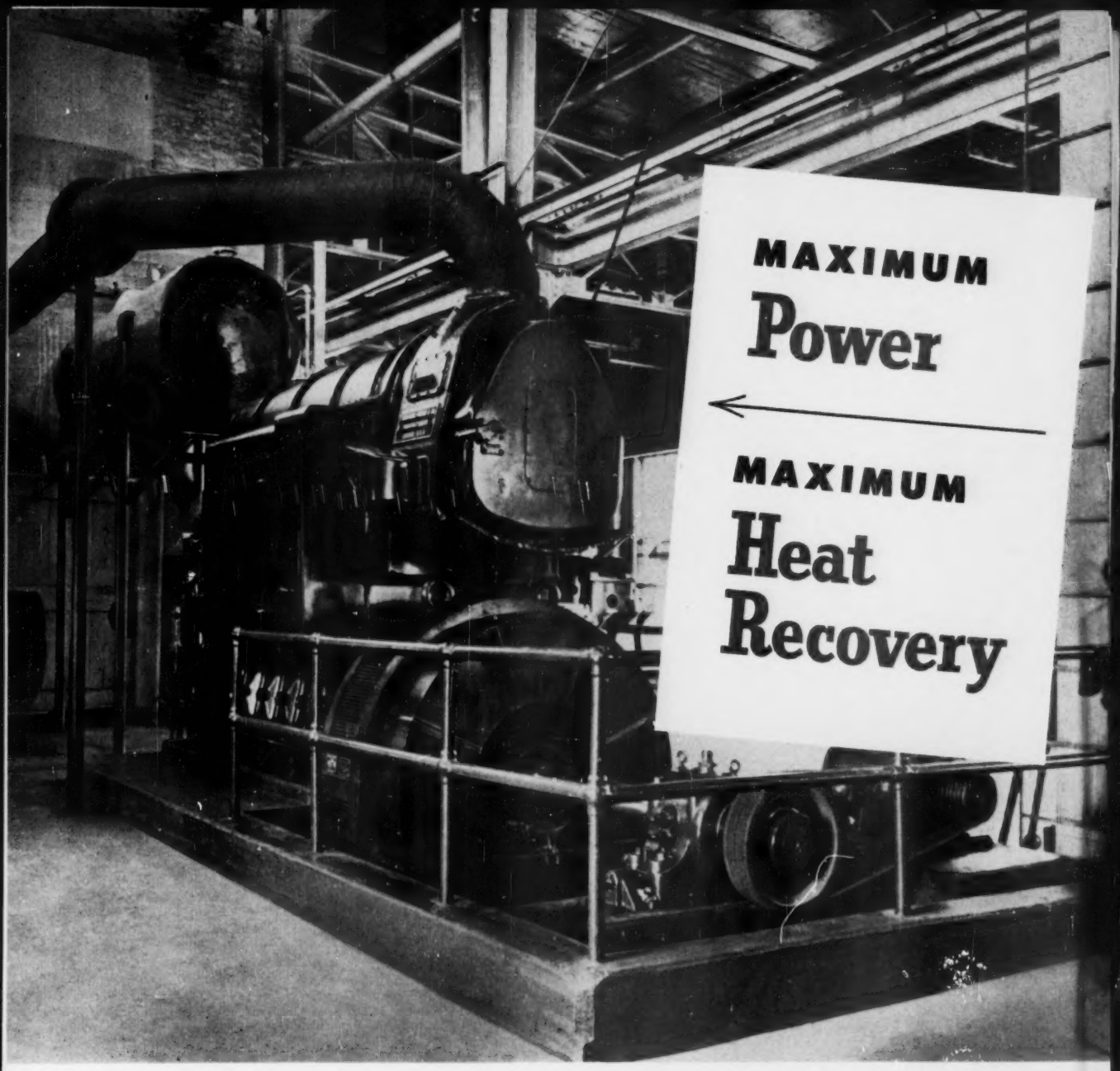
BELOIT AIR-CUSHIONED INLET and headbox on new No. 9 Machine at Detroit Sulphite Pulp & Paper Co.



ONE OF TWO BAUER BROS. Double Disc Refiners in Detroit Sulphite Mill. This one is used on refining of sulfite stock.



BIRD MACHINE CO. Saveall which is a new installation ahead of No. 9 Yankee Machine in Detroit Sulphite Pulp & Paper Co. Mill.



Inadequate, uncertain power . . . poor power factor . . . lack of flexibility—all were eliminated when the French Paper Company of Niles, Michigan, installed their Fairbanks-Morse Opposed-Piston Diesel generator.

After a full year on the line—24 hours a day, 6 days a week—without a single shut-down for repair or maintenance, they know they've solved the power problem. But, they have more than maximum power.

"Waste" heat from lube oil, jacket water and exhaust gases is used to heat plant process water. Pumped into two de-inking vats, at 160° F., this supply is a vital part of the plant's 48 tons per day scrap-to-pulp operations.

Fairbanks-Morse Diesel Engineering can solve your power problems. Chances are, there is also an opportunity for you to benefit from maximum heat recovery . . . or one of the other plus advantages of Fairbanks-Morse Diesel engines. Why not write today and see how we can help you? Fairbanks, Morse & Co., Chicago 5, Illinois.

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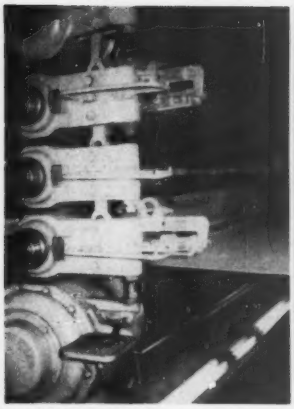
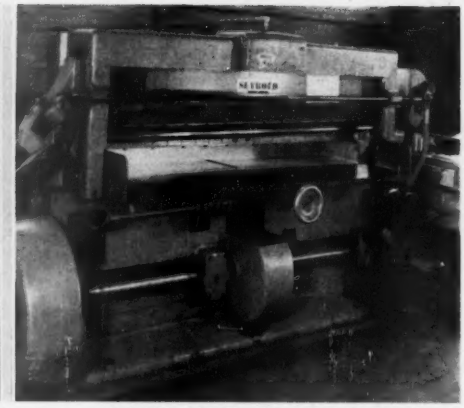
PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS



OSCILLATING DOCTORS and air cylinders are shown in this close-up of the calendar stack on the new No. 9 Machine at Detroit Mill.



SEYBOLD CUTTER—third one for Detroit Sulphite Pulp & Paper Co. This new one is large unit with automatic electric eye operation.

Chalmers centrifugal type 12 x 14 pump of 45 ft. head and 5,500 g.p.m. capacity and there is an Allis-Chalmers 12 x 14 centrifugal Dirtex of 110 ft. head and 5,000 g.p.m. Crane valves are used extensively.

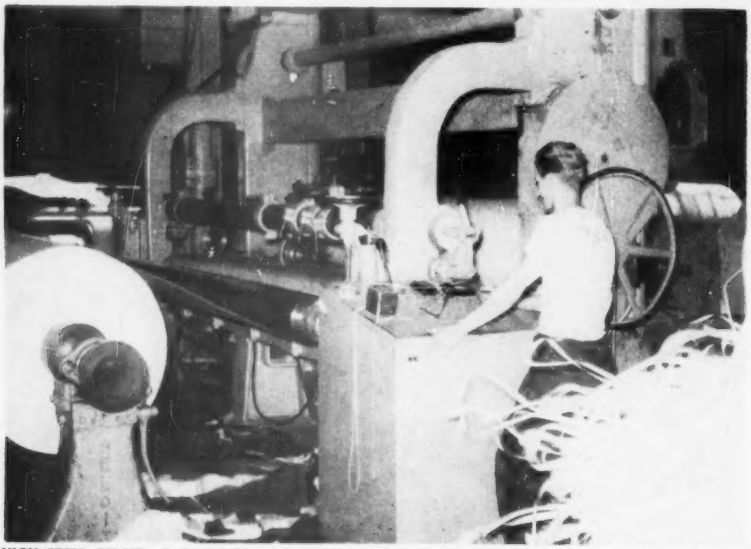
A newly installed rotary 2-stage air compressor made by Fuller Co., Catasauqua, Pa., is of 772 cfm. capacity at 80 lbs. pressure and is driven by a Reliance motor. It has been added to serve the paper mill. Shartle Bros. provided the broke agitator at the transfer press and machine and beater chest agitation.

An unusual new installation is a Bird Vickery Felt Conditioner equipped with four jordan-type vacuum boxes operating on the bottom felt of the new machine. Similar Vickery equipment was recently installed on No. 7. There are only two other paper mills operating conditioners on bottom felts on Yankee machines, it is said, and this has allowed them to operate without the two conventional showers and the wringer rolls. In each case operators reported there has been an improvement in felt life and a saving of fresh water.

In the finishing division of Detroit Sulphite, a third Seybold cutter has been added. This is a big unit, with automatic electric eye operation and modern improvements. There is also a big Dillon cutter, as well as smaller converting equipment of various uses.

The modern high-pressure power plant was a fairly recent addition. The mill uses 30,000,000 gallons of water daily, and its water filtration plant, its Jenssen towers and acid-making plant are landmarks for thousands of motorists who have driven along Detroit's famous Jefferson Avenue passing right in front of the mill.

The Products of Detroit Sulphite include all kinds of waxing grades—bread wrap and opaque waxing. Coating papers are machine coated on No. 5 machine. Box cover and creping papers, as well as all kinds of various tissues and carbonizing papers, are also made.



HIGH SPEED BELOIT—2-drum Winder for No. 9 Machine at Detroit with Reliance Engineering drives and controls for roll ejector and rider roll drive, hydraulic roll-lowering table and shear-cut slitters.

It is remarkable the number of long-time Detroit residents who have worked up in this company to positions of responsibility under Mr. Carleton who, as we have stated, is a Michigander himself.

Kenneth G. Sell is vice president, sales, and has been with the company for some 20 years.

Vice President Lawrence Hulbert and Secretary-Treasurer Russell A. Mills have also been with the company a great many years, as has Walter A. Stark, assistant treasurer.

Dr. Roy L. Davis is vice president in charge of production and general superintendent. He is a "Down Easterner" having come from Maine where he attended Bates College. Later he attended the Institute of Paper Chemistry. He was formerly with S. D. Warren and Consolidated Water Power & Paper Co.

Gordon Morseth is the assistant general superintendent. He is a native of Everett, Wash., a graduate chemical engineer of the University of Washington, and formerly was with Puget Sound Pulp & Timber Co.

Louis A. Tweet is the veteran paper mill superintendent who has been at Detroit over ten years and was formerly with another Michigan mill at Port Huron. He originally came from the Green Bay region of Wisconsin.

Martin F. Schnaufer is chief engineer, a graduate of Michigan's own College of Mining and Technology. He has been at the mill many years and was formerly an engineer with Fruehauf Trailer Co.

Bernard C. Johnson is pulp mill superintendent and also has supervision of woodyard and wood preparation. He was born in Detroit and attended Michigan State College.

Dr. Leslie L. Larson is technical director. He is a native of Idaho and a graduate of the University of Idaho. He received his Ph.D. from the Institute of Paper Chemistry.

Another Detroit man is Edgar L. Giffen, the personnel and industrial relations supervisor, born and raised in the motor city.

Charles G. Allen is head of the woods department in Detroit. He is a University of Michigan graduate forester who in 1940 obtained his Master's degree at Ann Arbor. He has been at the mill 12 years.

That is the story of Detroit Sulphite Pulp & Paper Co., and we should not leave it without recalling that it made a wonderful recovery after being virtually destroyed in 1903 by a disastrous fire. Through the years, with the eventual aim of total integration always in mind, plans were carefully laid which resulted in the present completely self-contained operation.

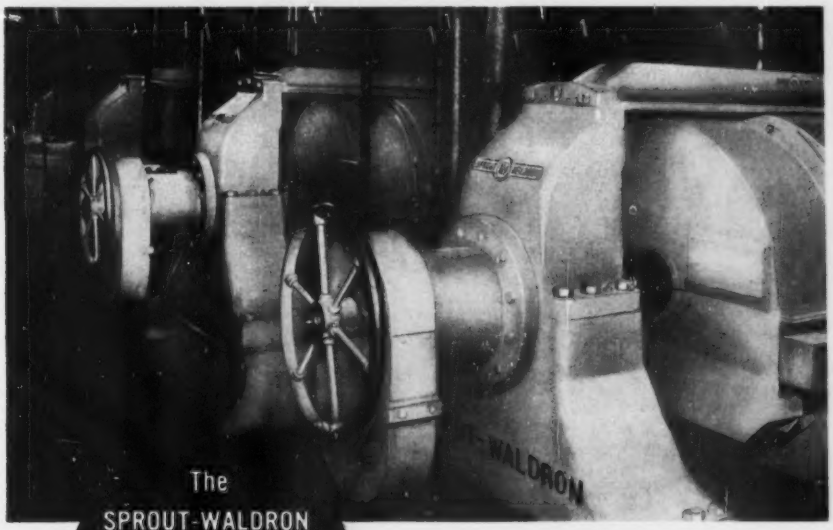
There are elaborate testing and engineering facilities to keep its products on the highest grade. It might be well in closing to note that its slogan in sales *"Makers of Papers of Strength,"* might be adopted as a descriptive phrase for the company itself, which has been built on strength in being entirely self-contained, with control and management of its own operations and processes all the way from the forests to the finished product.

semi-chemical

to solve pulping problems economically...

Groveton Papers Company uses Sprout-Waldron Refiners

The First Semi-Chemical Pulp Mill in New England
uses three SPROUT-WALDRON 450 h.p. 36-2 Refiners
to produce neutral sulphite semi-chemical pulp.



The SPROUT-WALDRON refiner is the leading producer of semichemical pulp

high pulp quality

rugged construction

high capacity

low maintenance

flexibility of operation

Want more information on semi-chemical pulping?
Send for our file of technical and practical data.
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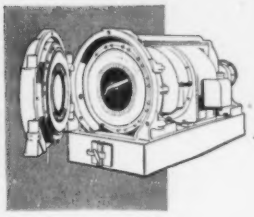


SPROUT-WALDRON

PULP REFINERS

268

St. Regis Has "Convention" Inside a Convention

An unofficial check indicates St. Regis had the biggest delegation of engineers from any single pulp and paper company at the Chicago Engineering Conference. They stayed one day longer than the crowd and had a "convention" of their own as an aftermath of the big meeting—and probably they will do it every year, now. They had their own dinner party, with wives and womenfolk, in the Morrison the following night.

William R. Adams, vice president in charge of all manufacturing, St. Regis Paper Co., New York, attended the affair. The engineer who came the farthest was S. J. Selden, for many years consulting engineer to the Tacoma, Wash., operations of St. Regis. Of course, Justin McCarthy, chief engineer of all the St. Regis mills, now completing the Jacksonville mill, and Russell Seip, chief engineer at Pensacola Kraft Center, were on hand.

Just checking down the names on the registration list we note: Jesse Jackson, from Pensacola; Paul Taylor, East Pepperell, Mass.; Wm. Brown Jr., Howland, Maine; Norman Danforth, Bucksport, Maine; A. P. Davis, Bucksport; H. R. Emery, Deferiet, N.Y.; M. J. Goloff, Kalamazoo; Robert Major, Pensacola; Al Mortenson, Pensacola; Bob Welch, Carthage, N.Y.; Ado Zando, Deferiet. James Snyder, manager at Bucksport, and Lester (Lefty) Smith, newly named superintendent, at Harrisville, N.Y. also were at the convention.

Putnam Toastmaster At Engineers' Banquet

One of the climactic events of the conference, though it came midway, was the banquet. Donald Putnam, who came out of little North Dakota State College to head up the far-flung sales in pulp, paper and lumber for General Electric, did a nice job as the toastmaster.

Mr. Putnam introduced W. C. Reynolds, a Racine, Wis., editor who took time out from that job to make some 60 addresses last year. It is doubtful if there were many dissenters from his speech, which was in line with most already-well formulated opinions on politics, etc., in his audience and probably didn't win any new votes, but did provide some intimate slants on his own war experience in Europe.

The speech may not have offered much that was new but the banquet gave a lot of engineers the chance for getting together.

Hyer Interprets Meaning Of Industry Expansion

Allan Hyer, with recent as well as World War years behind him of experience in serving as an industry consultant and allocation executive in Washington, D.C. told the Engineering Conference:

"If you don't want government men in business, then you must see to it that we have more business men in government."

The Bagley & Sewall sales chief quoted Gabe Ticoulat, Crown Zellerbach v. p., who last year headed the Pulp & Paper Division of NPA, as declaring "mobilization is not complete with Korea needs and it may never end." With Mr. Ticoulat and Buff Natwick and R. A. McDonald of Crown, Mr. Hyer also singled out for praise for their services in Washington, John Maloney of Hoberg, Lew Nicholson of D. C. Paper Mills, Lyall Tracy of Rayonier, and Jerry Strattner of West Virginia.

"Most paper controls have been lifted and more will be eliminated," he said, but he added that a military-civilian program for the paper industry is pointed to a peak in 1955. "Any prediction can only be a good guess and the industry and nation must develop resiliency and adaptability to meet any emergency."

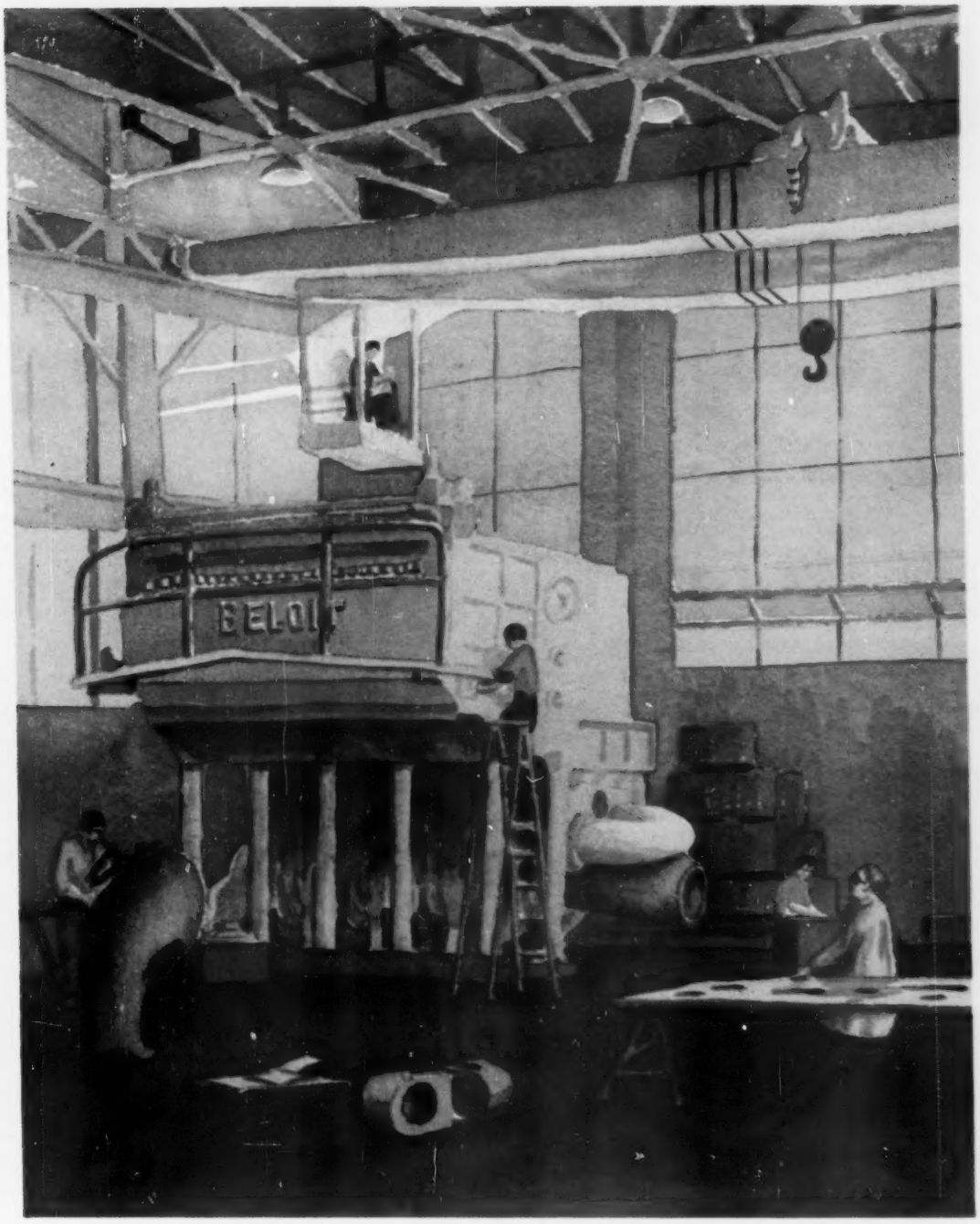
He quoted Morris Dobrow, of the Writing Paper Mfgrs. Assn., in presenting data as evidence that the industry has not over-expanded. Many mills are still "living on borrowed time," he said, and need improvement, and the actual number of entirely new machines coming in during the next two years will be small. New production by 1953 will be 2¼ million tons, by 1955, 3 million more.

Mr. Hyer recalled how the '20s produced speeds of 1,000 f.p.m., anti-friction bearings use and better designs. But from 1929-45 there was very little increase in production except for 1938-39. This, he said, was reason enough for the new machines now coming in, largely as replacements.

PARTICIPANTS IN CHICAGO CONFERENCE (l to r): A. E. DREW, Chief Engineer, Southland Paper Mills, one of leaders of strong delegation that came from Dixie; DONALD PUTNAM, Toastmaster at the big dinner event, who is Manager of Pulp, Paper and Lumber Industry Sales for General Electric Co.; WILFRED WYBURN, newly appointed Chairman of one of engineering committees, a Brooklyn native and Stevens Institute grad, who is Consulting Engineer for Federal Paper Co., Bogota, N. J.; JOHN B. GOUGH, now Consulting Engineer for Mead and formerly Chief Engineer (native of Liverpool) who gave paper on his specialty—converging nozzle type slices; JOHN D. LYALL, Project Engineer for Armstrong Cork Co., Lancaster, Pa., who has headed Engineering Research and Machine Design Committee for three years; and PAT A. FORNI, Chief, Forest Products Branch, Mutual Security Agency, Wash., D. C., a luncheon head table guest.

ST. REGIS COMES IN STRENGTH

ONE OF LARGEST, if not largest, delegations of engineers at the TAPPI Annual Engineering Conference was from St. Regis Mills from Coast to Coast. Here are just a portion of them. Top row (l to r): JUSTIN McCARTHY, Chief Engineer, St. Regis Paper Co. (Dartmouth grad), presently resident at Jacksonville, Fla., completing new mill; A. P. DAVIS, Chief Engineer of the Bucksport, Maine, Mill, who is a Cornell '14 graduate; ADO A. ZANDO, Assistant Chief at Deferiet, N. Y., and BERNARD KOZIOL, Plant Engineer at Deferiet, both from Clarkson College; ROSS EMORY, Power Engineer, Deferiet, a Tufts College grad.
BELOW (l to r): JESSE JACKSON, native of Iowa and Cornell alum, Paper Mill Engineer, at Pensacola, Fla.; WILLIAM BROWN, Plant Engineer, Howland, Maine, Mill, another Clarkson man; ROBERT WELCH, Supervising Engineer for Carthage, Watertown and Herrings, N. Y., Mills, still another from Clarkson, and RUSSELL G. SEIP, Chief Engineer for the Kraft Center at Pensacola. We didn't catch up with Russ again to get his alma mater, but he is, of course, one of the best known of all St. Regis engineers and their dean in the South.



WATER COLOR PAINTING BY L. J. A. MEESE

NEW ERECTION FLOOR at Beloit Iron Works provides additional floor space, high ceiling and heavy-duty cranes needed for erection and checking of Air-cushioned Inlets, Fourdriniers, press framing, dryer framework, supercalenders, and winders for high-speed, high-production paper machines.

all through the mill

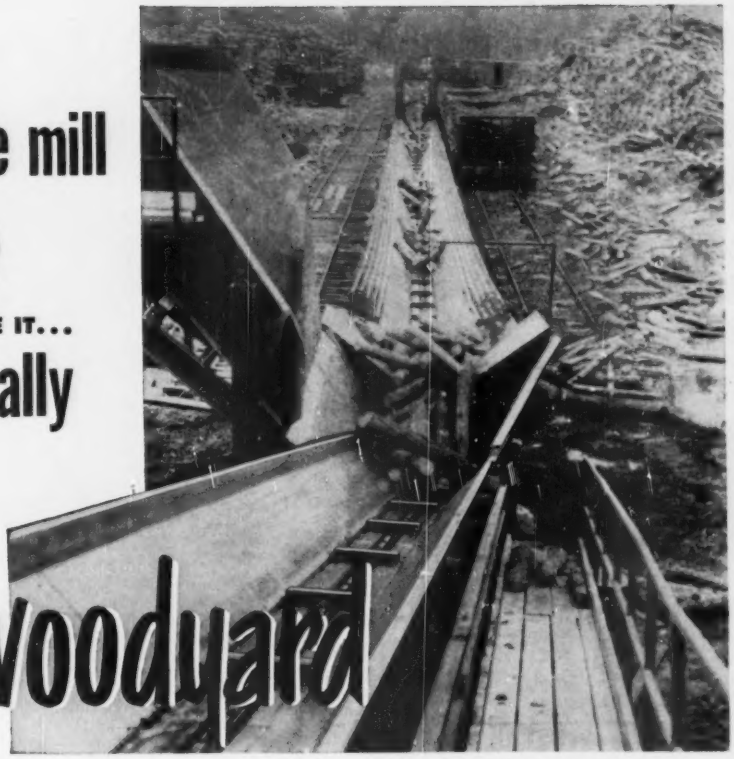
REX®

HELPS YOU HANDLE IT...

economically

FOR EXAMPLE...

the woodyard



Here is a fine example of a woodyard conveying system designed by Rex engineers. This one is in a large southern pulp mill.

All the way from pulp wood to paper, Rex can help cut your handling cost. Chain Belt Company's wide pulp and paper mill experience can "engineer out" many of your headaches. Their engineers are constantly alert to the change and progress within the industry. Whether it's by chains, belts, bucket elevators or any combination, Rex men are experts at recommending the one overall plan that is best for your particular operation.

Take the woodyard, for example. Moving "sticks" from storage pile into the mill may call for several different types of chain or other conveying methods. It may call for construction of special troughs, ramps, tracks and other major items. You'll find it well worth while to let the Rex man help you plan the whole operation. His knowledge of your problem, plus his knowledge of the complete Chain Belt line of Chains, Idlers, Conveyors, Elevators and the like, makes him your "right hand" ally in your search for finding the *best* way of doing the job.

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Electrical Engineering

CHICAGO HIGHLIGHTS AND COMMENTS

By M. J. Osborne

Electrical Engineer, Bowater Southern Paper Corp., and Member of TAPPI Electrical Engineering Committee

FOREWORD—As always, the electrical engineering sessions at the annual Engineering Conference are outstanding. For this reason, PULP & PAPER *again asked a member of the TAPPI Electrical Engineering Committee to review these sessions at Chicago.*

M. J. (JOHNNIE) OSBORNE (in picture), who is electrical engineer for the new Bowater Southern Paper Corp., building a kraft and newsprint mill in Tennessee, formerly in the similar capacity at Crossett Paper Mills, has written the following review and commentary. He has discussed the electrical engineering subjects that were of particular interest to him, and—at our invitation—expressed some opinions of his own.

Mr. Osborne, Florida-born and graduate of Georgia Tech, '44, was two years at Oak Ridge working on electro-magnetic separation in Atomic Energy activities. After war service on turbo-electric tankers, he went to Crossett to help K. O. Elderkin develop record-breaking high speed kraft production, and followed his chief this year to the new Bowater enterprise.

Many of the leaders at Chicago told PULP & PAPER *that one of the greatest advances made in the Conference this year was the preliminary development of a code of electrical specifications for electrical cable. This was truly a monumental work done by Al Mortenson of St. Regis and his subcommittee. Mr. Osborne offers constructive comments on this work—also on other Chicago papers, as follows:*

"*Recommended Electrical Cable Specifications for the Pulp and Paper Industry*" was read by A. O. Mortenson (St. Regis, Pensacola, Fla.). This paper is the result of two years of work by Mr. Mortenson, the cable manufacturers in this country and Canada, TAPPI, IPCEA and CPPA. The subject is of such importance and is of such scope that it will take all of us in the industry quite a while to absorb and digest the information that was presented in this paper. It has already started considerable engineering discussion.

This project started out as a simple progress report on the application of electrical cables in the pulp and paper industry but after the work had begun, the Electrical Engineering Committee and others urged that Mr. Mortenson and his subcommittee make recommendations and present specifications to TAPPI that can be adopted as TAPPI Standards and used by mill and consulting electrical engineers.

From a questionnaire submitted to the industry in May, 1951, a fund of information was received, recorded and studied by all of the above-mentioned organizations. The study revealed the insulation that has been preferred from what the market afforded, for the various departments and services throughout the entire industry. In addition, wiring design and other trends throughout the industry were tabulated.

THE AUTHOR—JOHNNIE OSBORNE, Electrical Engineer, Bowater Southern Paper Corp. This is a special report for PULP & PAPER readers.

The shielding of insulated cables was discussed first under the sub-title, "*The Disadvantages of the Ignorance of the Purpose of Shielding.*" This subject is controversial and should well be listed first in the report. The controversy concerns the insulation, voltage and manner in which cables shall be shielded. This portion of the report should be studied further and expanded. Mr. Mortenson starts off as follows: "We believe it is granted among engineers that cable with semi-conducting sheath very definitely has a place in our damp, wet industry." This statement is safe and, I think, solidly substantiated.

The next sentence should be studied a little. "The National Electric Code stipulates shielding of rubber-insulated conductors on all voltages above 2000 because of the ease with which such conductors can be damaged by corona which occurs at the higher voltages, especially under alternating moist and dry conditions. . . ." I believe that the N.E.C. requires shielding for rubber-insulated conductors *with a fibrous jacket* for services above 2000 volts and the shielding shall be either metallic or semiconducting. IPCEA calls for shielding of all cables for services above 2000 volts and NEMA *Standards for Rubber-Insulated Power and Control Cables* call for shielding of non-leaded Neoprene sheathed cable under all conditions for use above 6 kv grounded and 6 kv ungrounded. The confusion that exists on this point between the NEC, IPCEA and NEMA should be removed and the three should be made to agree for paper mill applications.

I agree, in general, with the recommendations that for 2300 volts "Ozone Resistant Insulation, No Shield" and for 4160 volts (and up) "Ozone Resistant Insulation Shielded."

An outstanding sentence in this section on shielding is: "The electrical craft must be better educated in the technique of handling this type of cable (shielded) before it can come into general use even though there is a great need for it in all industries, particularly the paper industry where there is so much moisture, dampness and humidity." This statement is quite true, but it is also a responsibility of the cable manufacturers to furnish all of the necessary tools so that the electrical craft can be properly educated by the engineers. By tools I mean, splicing and terminating drawings and instructions for the particular type of shielded cables sold. This data should be assembled into stiff-backed books suitable for use by electrical mechanics in the field. In addition, splicing kits should be listed and advertised along with the cables. These kits should contain all the insulating and shielding tapes and compounds required.

Mr. Mortenson picked another lively topic: "The questionable character of conduit as a raceway for wires and cables and the advantages of open wiring of any sort."

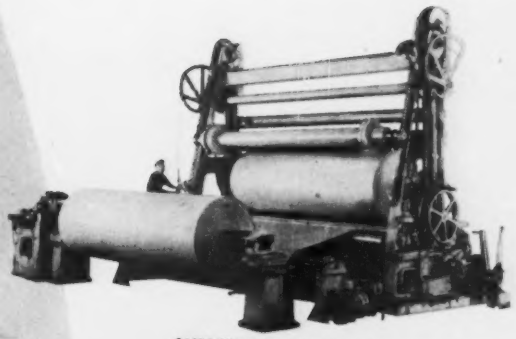
I think that this subject should be qualified but in general, it represents the thinking of many engineers. My opinion, however, is colored by two recent and very serious insulation fires that occurred in open wiring and each fire shut down a paper mill for a long and costly period of time. One fire was started by lightning and the other was the result of a fault in the wiring of a Ward Leonard type paper machine drive. Neither of these fires would have had such serious consequences had the wiring been in conduit, supplied with interlocked metallic armor or fireproofed.

I install conduit for circuit isolation in event of fire or a short circuit and for mechanical protection, but not to keep moisture away from the wires. The jacket on the cables (Neoprene or lead) is supposed to keep water out of the insulation. However, I do make proper provision to assure drainage at low points in conduit runs. Water collects, as Mr. Mortenson states, but the drainage as I install it is to keep water from running down conduits into the controls. This has happened on several occasions.

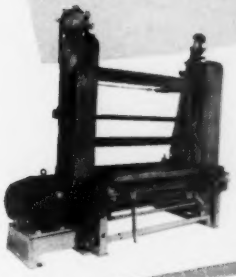
Interlocked metallic armored cable in racks seems to have found favor in our industry. Multiple conductor, Neoprene-jacketed control cables in trays or on racks look attractive to me. Control cables are racked in this manner in many central

Better Rolls

For two generations Camachines have set the top standards for quality in roll production. Every design feature of modern Camachines has been precisely engineered to help you produce rolls of finest quality . . . clean-cut, wrinkle-free and uniformly wound to the exact degree of "hardness" that you need. Camachine-made rolls stand up better in handling and shipping, and because of their uniform density they feed out with a smooth flow that means complete freedom from unwinding troubles. Ask your customers . . . they will tell you that Camachine-wound rolls are a better buy in every way!



CAMACHINE TYPE 19 One of the famous line of Camachine high-speed heavy-duty mill type winders.



CAMACHINE COMMANDER (Type 10). Popular heavy-duty slitter-rewinder for finishing rooms and converting plants.

at lower cost

Camachine winders and slitters are built to keep downtime, repair and replacement costs at a minimum. Even when operating at Camachine's record-breaking speeds, vibration and consequent wear are virtually eliminated. And when normal wear calls for replacements, Camachine's trained service department stands ready to speed the shipment of new parts. Ask your maintenance men and they will tell you why Camachines stay on the job!

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EXECUTIVES AT CHICAGO CONCLAVE

A congenial group at the Engineering Meeting (l to r): W. C. KLESNOR, J. O. Ross Engineering, Chicago; ED E. HELM, Vice President, Reliance Electric & Engineering Co., Cleveland, O., SAX FLETCHER, President of J. O. ROSS, New York, and RUSSELL JOHNSON, Assistant Chief Engineer, Staff Engineering, Kimberly-Clark Corp., Neenah, Wis.

JUST PART OF WESTVACO'S GROUP

Some of West Virginia Pulp & Paper Group at Chicago were (l to r): GEORGE GRIFFITH, Civil Engineer, Luke, Md., Mill., now on leave for graduate work at Ohio State; W. M. LaFON, Paper Mill Engineer, Luke Mill; EARL WOLCOTT, Design Engineer, Charleston, S. C. Mill, and GEORGE P. RAMSAY, Project Engineer, Charleston Mill.

station installations as well as in our own industry.

"Pressurizing and ventilating of control rooms has been smiled upon and adopted quite generally throughout the industry." At first glance, the mention of this trend seems out of place in this cable report, but consideration must be given to the fact that the problems of interconnecting wiring in these rooms are different from the problems of wiring throughout the mill. The design and ventilation of control rooms could well be a TAPPI paper.

The trends in wiring today are republished in this report because I feel that further comments and opinions should be gathered by the Electrical Engineering Committee on the subject and should be carefully weighed. This particular collection of data should then be allowed to "season" for a time before the Electrical Engineering Committee makes definite recommendations to the industry:—

Trends in Wiring

"(1) Aerial self-supporting cable for prime feeders up to 500 MCM. . . ." A pre-assembled 15 kv, 500 MCM 3 conductor aerial cable with messenger and binding tape seems rather large to handle. I think the trend is to use aerial cable, but voltage should be mentioned as well as type of insulation when limiting the maximum size. The engineers should be cautioned to specify a messenger and binding tape that will withstand the chemicals present around paper mills.

"(2) Confining thermoplastic to size #4 maximum because of the tendency of the insulation to deform under pressure of the copper conductors on bends in the larger sizes and so decrease the dielectric to ground; (3) Thermoplastic for lighting installations and control services because of its small diameter and smaller conduit sizes required; (4) Thermoplastic for temporary or short duration installations because of its favorable first cost; (5) Thermoplastic in existing conduit installations, where the copper size must be stepped up; (6) Preventing failures where vibration is present with added insulation in the form of fiber sheeting in pull-boxes and mouths of conduits; (7) Placing a neoprene jacket over each conductor in a cable and then covering the whole with a neoprene jacket, giving protection on protection; (8) Use of asbestos varnished cambric for switchboard wiring in the turbine room and machine room and thermoplastic for small control boards using #16 gauge wire or smaller in all departments, including wet locations; (9) Ventilated copper bus between generators and switch boards; (10) Paper insulated lead covered or paper insulated steel armored cable for prime and sub-feeders; (11) Serving portable conveyors through retractable reels; (12) Interlocked armor over neoprene sheath; (13) Use of a protective neoprene cover over galvanized steel conduit to prevent corrosion and consequently, lengthen the protective life of conduit in wiring installations. (Unprotected conduit now fails in as little as three (3) years in some locations); (14) Subfeeders in copper bus enclosed in sheet steel gutters as part of unit substation designs; (15) There is quite a general trend in Canada toward Pyrotenax, and English cable, on all new installations. Its durability under general paper mill conditions, its low first cost and its ease of installation has popularized it there.

Other Trends

Braids are being frowned upon as a covering. Braid rots and disintegrates and soon becomes worthless in many installations.

It might be of interest to note that a metal encased high temperature (250°C) completely moisture sealed cable is now on the market for 600 volt service. It could well find a wide application in the paper industry, if the price is right and the economics of the situation doesn't play against it."

One question was asked that was of particular interest:

Question: Does the recommendation of "Impregnated Paper Insulation Lead Sheath" for 6600 and 13,200 volts preclude the recommendation or use of varnished cambric, thermoplastic jacketed metallic armored cable for these services?

Mr. Mortenson: No, indeed. It is being used and is mentioned in the report. There is no reason why it should not be included. It is my intention to add these recommendations and specifications in the first revision.

"The Recommended Specifications in Brief" since they are the opinions of the majority throughout the industry should become TAPPI Data Sheets and *"Specifications For Wire and Cable For All Branches of the Pulp and Paper Industry"* should be made into TAPPI Standards. As new and superior insulating materials or improved methods of cable manufacture are discovered, these Standards or Data Sheets can be revised.

Press Section

"Press Section Load Requirements" was read by R. R. Baker (Westinghouse). To re-evaluate TAPPI Data Sheets 145-G-H-I, which give recommended power constants for the various sections of the paper machines, the Electrical Engineering Committee decided to make a detailed study of the press section. This paper represents the study on the part of Mr. Baker and his subcommittee of 262 power test readings covering 108 different machine sections. From this study it was found that only width, speed and nip pressure had a definite relation to load. Weight of sheet, roll diameter, covering, bearings or press felt length had no appreciable effect on load.

Recommendations have been made for modifications and corrections of the power constants appearing on the TAPPI Data Sheets as shown below:—

Main Presses—On the main press for all paper and board formation, it is recommended:

1. That the NRL constant be calculated as follows:

$$\text{NRL constant} = 0.011 + 0.004\ \frac{P}{100}$$

Where P is the applied nip pressure in pounds per linear inch.

2. That the RDC constant per pair of rolls retain its present value of 0.03 up to a maximum nip of 300 lb. per linear in.
3. That the RDC constant for top press roll only, retain the present value of 0.010.

On main presses, when used for pulp sheet formation, it is recommended that new constants be added to the present data as follows:

1. $\text{NRL constant} = 0.025 + 0.00275\ \frac{P}{100}$
2. RDC constant per pair of rolls use 0.045 up to a maximum nip pressure of 900 lb. per linear in.

(Continued on page 58)

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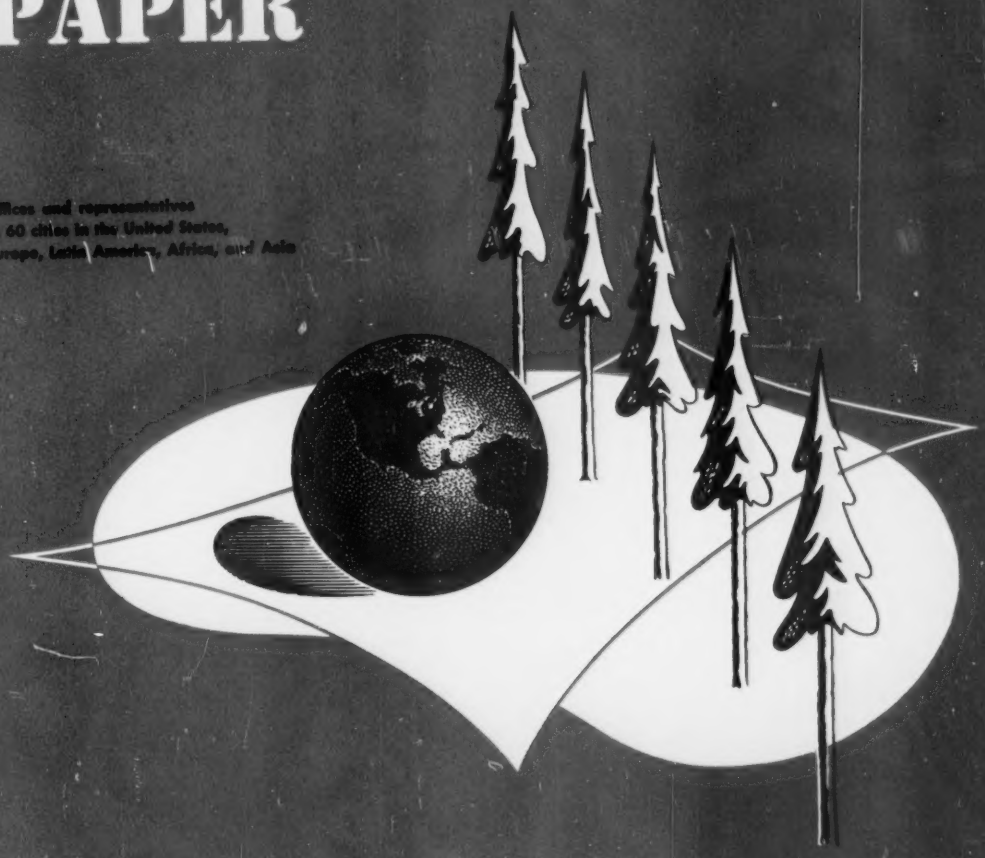

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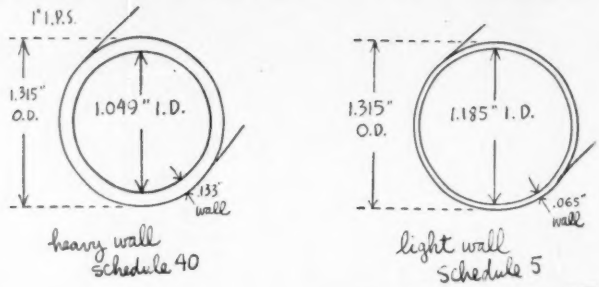
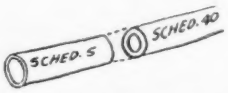
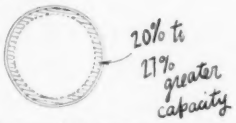


You save money. Schedule 5 pipe costs about half as much per foot as Schedule 40.

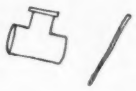


Schedule 5 has the same O.D. as Schedules 10, 40 and 80 —for hook-up with existing lines as well as for new installations.



Its larger I.D. increases flow and capacity in pipelines, exchangers and other equipment.

It's lighter. This means quicker and easier installation.



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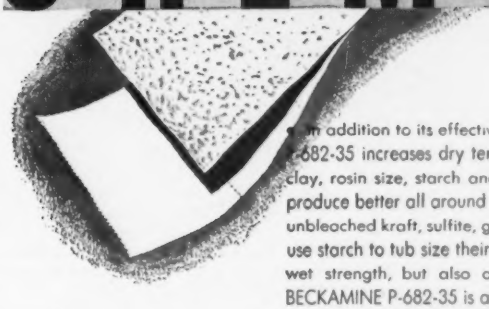

In addition to its effectiveness as a wet strength agent, Reichhold BECKAMINE P-682-35 increases dry tensile and Mullen strength and aids in the retention of clay, rosin size, starch and other beater additives . . with the result that you produce better all around wet strength papers. It may be applied to bleached or unbleached kraft, sulfite, ground wood, rag or mixtures of these pulps. Mills which use starch to tub size their papers find the addition of this resin not only imparts wet strength, but also aids in laying fuzz and improving scuff resistance. BECKAMINE P-682-35 is a urea-formaldehyde resin of the cationic type and can be diluted infinitely with water without precipitation. For complete information, please write for booklet number 300.

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ELEC. ENGINEERING by Osborne

(Continued from page 54)

3. RDC constant top roll only use 0.015.

Smoothing Press—The power data obtained on the smoothing press section indicate that the NRL constant per pair of rolls should be reduced to 0.0070 instead of 0.0090 and that the RDC constant of 0.0120 should be retained.

Size Press—The limited number of power readings obtained on the size press section, although suggesting a possible reduction in NRL and RDC constants, is not considered of a broad enough coverage to justify a change in the original recommendations which provide an NRL constant per pair of rolls of 0.015 and an RDC constant of 0.025.

Dual Press—This report covers a very limited amount of data on the power requirements of the dual press section. These limited data, although indicating a somewhat lower power requirement, do not justify any change in the original committee recommendations which suggest for each side roll an NRL constant of 0.0200 and an RDC constant of 0.025.

Problem of Utility Tie

"Protection For An Industrial Plant Connected To A Utility System With Reclosing Breakers" by D. F. Langenwalter (General Electric Co., Schenectady, N.Y.).

This paper is intended as an introduction to the study of the problems or relaying the tie between an industrial plant and a utility system. Utilities have found that fast reclosing breakers on their systems enables them to provide for a minimum of customer power interruptions. Fast reclosing can provide greater continuity to the industrial user provided his machinery will not be damaged by the surges which occur when a breaker recloses with the synchronous machines out of step with the power system. There are three basic circuits that may be used to tie a utility and an industrial customer:

1. The double line, each line has a reclosing pair of breakers. For a minimum of outages this system is the best and also the most expensive. The chances that both lines would be out are rare. A synchronism check or an undervoltage relay should be used across the two power company breakers to prevent reclosing where both lines were out and the industrial plant drifted out of step.

2. The single line and single pair of reclosing breakers supplying the industrial at the end of the line is next in reliability. Power has to be interrupted for at least 15 to 20 cycles with this system.

3. The cheapest system and the most common, according to comments from the floor, is the simple tap from some place between breakers on a utility line. This system may or may not have reclosing on the utility lines. If the plant generators are overloaded when the utility power is interrupted, then non-essential loads should be dropped by a suitable underfrequency, reverse power or inertia relay. The generators can carry the essential loads indefinitely. The utility tie breaker and nonessential feeders are energized manually when utility power is restored.

The following conclusions were reached:

"The utility can reclose breakers after an interruption of power without causing any trouble if the synchronous machines in the industrial plant stay nearly in step; i.e., the power angle is less than the critical value at the time of reclosing. Whenever the power from the utility is totally interrupted, the load in the plant should be reduced to the level which the generators can carry. If there are no generators, the synchronous motors should be disconnected or the field removed and the fields connected to discharge resistors before the power is restored.

Two ratios determined the time available for reclosing: (1) the ratio of power being used, Pu, to the maximum which can be transmitted, P_m; and (2) the ratio of the stored energy H to P_m . . ."

"Where the slow reclosing equipment is used with a single tie line, the industrial plant should always be disconnected so the reclosing breakers do not close the tie. Resynchronization can be done manually or automatically, the nonessential loads to be restarted after the system is in synchromism again.

Where fast reclosing equipment is used with a single tie line, the plant loads can be studied to determine the possibilities of reclosing.

Where two tie lines are connecting the plant to the utility, then reclosing on each line will always be successful, but if both lines are out at the same time, the industrial plant should be disconnected and resynchronized manually."

Mr. Langanwalter has supplied some clear and fundamental data in this paper which will be of value to engineers and operating people who study the problems of a utility tie. There are those who worry about the costs of power interruptions where the power is off a matter of cycles and the lost time is completed in hours.

There were some comments after this paper was read that I remember particularly.

Comment: Who would pay for this double line system, the utility?

Comment: Ha!

Comment: If the customer wants a double line, we will install it for him. The customer pays for the installation. (Cincinnati Gas & Electric).

Comment: What good is this reclosing anyway? At the first dip the sheet is broken on the machines and we have lost upwards of an hour anyhow. Might as well reclose manually. It is no good to us.

Answer: We need information on how the paper machines will ride through a disturbance. We have reason to believe that unless the rate of change of frequency is too great, the section drive regulators will not let the sheet break.

Comment: We ran just such tests as you mention for two machines with two different types of drives. Your company has this data somewhere. We recorded load change, rate of change of frequency, behavior of paper machines, everything. You just need a lot more data like that.

Prevention Maintenance

A preventive Maintenance Schedule for Paper Mill Electrical Apparatus was presented by A. M. Cooper (Westinghouse) to the Mill Maintenance and Materials Committee. This schedule for motor maintenance was prepared from a study of published maintenance information by the motor manufacturers.

It is intended that this schedule should next be studied by the mill electrical people for ideas and comments.

Electrical Engineering Discussion

There were about 40 people present at this discussion, 16 of whom were mill representatives.

A. *Supercalenders—by J. L. Van Nort*

Mr. Van Nort (Reliance Electric & Eng. Co.) presented a questionnaire which his subcommittee will use to obtain data on the power requirements for supercalenders. The reaction of the group was very favorable to this and there was little discussion.

B. *Chipper Power Requirements—by M. J. Osborne*

I discussed our program for obtaining data on the power requirements of chippers and the selection of motor types and ratings, and briefly reviewed the data already obtained from several electrical manufacturers and stated that two out of three chipper builders had agreed to cooperate. We are going to send out a questionnaire to the mills. The cooperation of the electrical manufacturers was requested in assisting the mills with instrumentation. This was agreed to by the motor manufacturers present.

The questionnaire will be designed primarily to get at the energy per cord required to chip. In the discussion which followed, it was decided to modify the questionnaire to ask for the per cent moisture, to estimate an average log diameter corresponding to the highest average experienced over a 4-hour period, to base all figures on a racked cord of 128 cubic feet (solids and voids). to request readings for a month. In addition to such energy readings (KWH), it was decided to consider taking power readings KW using a recorder chart speed of 6 inches per minute.

R. R. Baker, a member of the chipper subcommittee, presented an excellent paper on the selection of motor ratings for chippers. Of particular interest was the *Nomograph of Chipper Characteristics Using Induction Motor Drives.* At my request, Mr. Baker made this data available to the Electrical Engineering Committee because I felt that it was information that had been needed for some time by the industry, especially that section on application of induction motors for chippers.

It is the intention of the subcommittee to make such tools as Mr. Baker's *Nomographs* and formulae available to the industry in the form of TAPPI Data Sheets so that mill engineers, and not the chipper manufacturers or the motor manufacturers, select the proper motor type and rating. The mill engineers have a better knowledge of the wood supply, chipping schedule, average log diameter, etc., than anyone else. There was considerable discussion during this portion of the session.

A Correction—

While our recent feature on Rhinelander Paper Co., did correctly state its new turbine is Wisconsin's largest industrial turbine, we did overshoot in giving it credit for distributing highest voltage in this industry. Some Southern mills are higher and Mead at Chillicothe, O., has generation and distribution voltage of 13,800 compared to Rhinelander's 12,500.

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Notes Here and There From Chicago Conference

CURT YOUNG, engineering manager for Riegel, has taken over as one of new committee chairman of the Engineering Division by appointment of the division chief, Charles Sibler. Mr. Young, who is a Rensselaer Polytech product and was engineer with West Virginia for some years, takes over drying and ventilating from M. L. Barker of Beckett Paper. Another new committee head is *WILFRED WYBURN*, long time consulting engineer for Federal Paper at Bogota, N.J., a Stevens Tech man, who takes over power. And, of course, it is generally expected that corrosion in kraft digesters is such a hot topic it will bloom to a full-blown committee under *NICHOLAS SHOUMATOFF*.

THE BABCOCK & WILCOX PACKAGE BOILER, Type FM, standardized, shop-assembled, equipped and shipped complete, with fuel-burning equipment, draft equipment and combustion controls, was subject of a paper attracting considerable interest. PULP & PAPER learned that there have been three installation so far of this boiler—one in the Fibreboard Products mill at Sumner, Wash., another at a Union Bag converting plant in Chicago and the third in a Hinde Dauch plant.

JESSE JACKSON'S St. Regis, Pensacola) analysis of a cylinder vat was a sequel to an article published exclusively in the Sept. 1951 issue of *PULP & PAPER*, the illuminating and thought-provoking questionnaire and discussion of "Stock Formation on Cylinders—What is the Mechanism of It?" by *R. FRANK HOLLIS*, staff engineer, Alton (Ill.) Box Board Co. The article brought many comments that were published later, including one by Mr. Jackson. At Chicago, he told how at his mill an analysis of flow conditions step by step through the machine are made, with aid of hydraulic theory and other data, and results give an overall picture of what is happening to fibers in their progress through the machine. Mr. Jackson's replies to many of the questions raised by Mr. Hollis are published on page 70, Nov. 1951 issue, PULP & PAPER.

NICHOLAS SHOUMATOFF, West Virginia P & P Co. process engineer, who gave the paper on digester corrosion, is the son of the artist Elizabeth Shoumatoff, of New York. Her place in history is a fixture for she was present and lone witness at the death of Franklin D. Roosevelt in Warm Springs, Ga. He passed away while sitting for a portrait being done by her. Nick has been with Westvaco 11 years, graduated from MIT in 1939 and got his masters at Brooklyn Poly.

RONALD GORDON MACDONALD, secretary of TAPPI, met *RONALD GREGORY MACDONALD*, maintenance supt., Ecusta Paper Div. of Oilin Industries, at the Chicago convention for the first time. They both spell with a small "d." R. Gordon graduated from MIT, was born in Berlin, N.H., and forebears came from North Uist Island off Scotland. The Ecusta R. G. was also a New Englander, formerly of Boston, graduate of Tufts, and his forebears were from Edinburgh area.

HERCULES APPOINTMENTS

HOKE MARTIN (left), who moved west to Portland, Ore., Nov. 1 to become Dist. Sales Mgr., PMC Dept., Hercules Powder Co., as of Dec. 31. He succeeds MILTON J. MAGUIRE (right), retired after 30 years with Hercules, but who plans to remain in industry as a sales agent. DAN CAMERON has been transferred from Wilmington, Del., to Kalamazoo, Mich., to succeed Mr. Martin as Dist. Sales Mgr. there and ROBT. R. BUSS, of Kalamazoo becomes Asst. Dist. Sales Mgr. Native of Lowell, Mass., Mr. Maguire graduated from Rensselaer Polytech and was Sales Mgr. for Hercules at Albany, Carthage and Lockport, N. Y., and Portland since 1943. Mr. Martin, born in Mt. Holly, N. C., graduated from U. of N. C., taught for some years, joined Hercules in Kalamazoo in 1936, went to Freeman, Ont., as Res. Mgr., then back to Kalamazoo in 1951. Mr. Cameron, graduate of Purdue, has been with Hercules since 1939; Mr. Buss since 1932.

MIDWEST NOTES

O. C. CHRISTIANSEN, graduate of U. of Minnesota, 1947, has been promoted to paper mill superintendent of The Mead Corp., Escanaba, Mich. He succeeded *STANLEY LEISHMAN*, who accepted a position as general superintendent of Provincial Paper at Thorold, Ont. Mr. Christiansen has been working in engineering and personnel departments. *CLARK GREENLES*, machine room foreman and a 30 year veteran, moved up to assistant superintendent. *GEO. CHAMPLEY* succeeded him as day machine room foreman.

JOHN ARNOLD, graduate of Purdue, five year's experience in various mill posts, has become assistant to management, The Mead Corp., Escanaba.

ROBERT L. LEAF JR., manager at the Shawano's Little Rapids, Wis. mill who stays with the Shawano organization since the sale of that mill to Hoberg, and his wife, *JOLIE*, were proud parents of twins last Aug. 18, which we are a little late in reporting—but it's still news. They now have four children in their DePere, Wis. home, two boys and two girls. The twins are Dan and Jeannette, each just a little over 6 lbs. when born.

HOWARD LAYMON, division technical director, The Mead Corp., Chillicothe, received the 33rd Masonic degree in New York recently, the fourth in his city. He started with Mead in 1912. His hobby is the Spanish language and he is interested in Mexican news and literature. He received the Outstanding Citizen award of Chillicothe's Junior Chamber in 1938.

L. R. GROWDEN, vice president, The Mead Corp., Chillicothe, sent his son off for army training recently. Dick, the son, was a Mead engineering trainee.

DICK RADSCH, vice pres. and sales chief of Appleton Machine Co., celebrated his 73rd birthday at Appleton Oct. 18, with many old friends around him.

JAMES DE YOUNG, nephew of Appleton's De Jonge sisters, who are with the Thilmany and Bergstrom mills, was married some time ago, it was learned, to the former Ginger Hale of Wabash, Ind. He is in sales dept. of Container Corp. of A., in Wabash.

DAVE OBERWEISER, vice pres. and treasurer of Fox River Paper Corp., was a state vice chairman in Wisconsin of the Republicans for Thos. Fairchild for Senator committee. The latter opposed Sen. McCarthy.

CHAS. SEABORNE, ART SCHMALZ and others of a small party in Kaukauna, Wis., some from the Thilmany Mill, made their annual expedition to the Dakotas in pursuit of pheasant.

WM. A. J. MITCHELL, manager of Central States Engineering, Appleton, Wis., made a trip to Mexico and is advising some companies in pulp and paper there.

FRANK KREILING, paper mill supt., Thilmany Pulp & Paper Co., took his family for a vacation to Canada and Michigan.

MRS. EARL McCOURT, wife of Consolidated Water Power & Paper Co.'s manuf.-sales coordinator, and *MRS. TED OLSON*, wife of the president of Nekoosa Foundry, attended a national meeting in Indianapolis of the Girl Scouts, in which they are leading workers. Meanwhile their husbands took to the birdlands for a spot of hunting.

JAMES McCOURT, son of the Earl McCourts of Wisconsin Rapids, who is now working in development and research for converting division of Crown Z in Camas, was back home for a visit with his family in October.

HAROLD HILLIER, now on staff technical assignments out of Chester, Pa., for Scott Paper, had his family with him all summer, till school resumed, in Marinette, where he was on special work. This was their old home as he was former tech. director there, where he was succeeded by *CECIL BALDWIN*.

PHIL DIXON, technical director, and *H. O. BARNEY*, purchasing agent, both of Fox River Paper Corp., Appleton, made their first trips to the far west in November with Vice Pres. *DAVID OBERWEISER*.

RUSSELL McVICKER, the veteran purchasing agent of Chillicothe Paper Co., found so many old friends on an extensive tour of the Pacific Coast recently that he was 12 days behind schedule getting back home. His young relative, *BILL McVICKER*, however, is taking a big load off Russ's shoulders in purchasing at Chillicothe, a job which Bill is working into after wide experience in other departments.

JACK REDGRAVE, Mason-Neilan representative of Appleton, Wis., was passing the cigars recently for a young son, Martyn Robert. He was born June 11.

SOUTHERN NOTES

EDWARD M. ROOT, Southern sales manager for Black-Clawson Co. has moved its Atlanta, Ga., office from Decatur, a suburb, to 685 West Peachtree St., Atlanta 3. *FRED C. JONES*, sales engineer, is his assistant.

W. W. (BILL) MITCHELL, who helped install all the steam engines and then became operator of the pulp machine and beater engines when the Champion mill started up in 1908 at Canton, moved up the ladder to generator room engineer, maintenance foreman, and then superintendent, a position he has filled 30 years, is a 45 year veteran. Mr. Mitchell is the owner of a trained Tennessee Walking Horse. His son, William F. Mitchell, a graduate of Georgia Tech, is a vice president of Penn Salt Co.; another, John R. Mitchell, graduated at West Point, was with Gen. Patton in World War II, and is now a major with the army in Korea, and a third, David Lee, is a medical student at Duke.

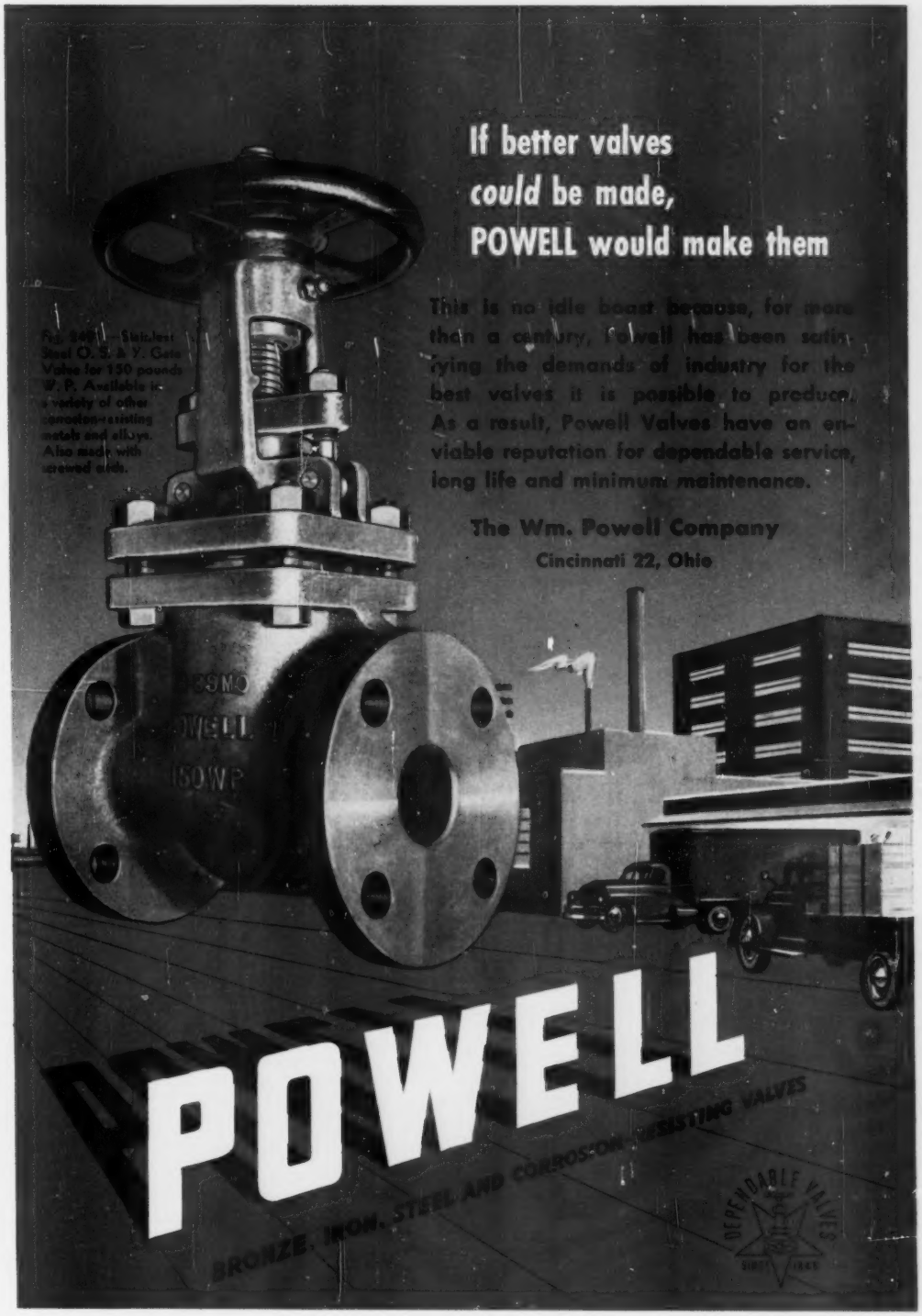
U. K. HYATT, pulp drying dept., Champion Mill, Canton, N.C., has retired with more than 27 years of continuous service to his credit.

HOWELL C. COBB has become superintendent of Louisiana State Forest, at Alexandria, La., succeeding James Ritchie, who resigned.

HOEL H. HASKINS, assistant executive for the Forest Farmers Association, Valdosta, Ga., resigned to accept an appointment with TVA.

W. R. SHOOK is manager of the new office of Electric Machinery Mfg. Co., Rm. 401, Georgia Savings Bank Building, 84 Peachtree St., N.W., Atlanta 3, Ga.

FLMER F. MYERS has been transferred from New England sales territory to represent Farrel-Birmingham in an office at Fayetteville, N. C. He can be reached at P. O. Box 3157 or telephone 3-0353.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'TWAS PERHAPS TOO EARLY TO SING THE MAINE SONG—"Drink to all the happy hours, drink to the careless days!"—but here are the MAINE ALUMNI happily gathered at their Breakfast Meeting at the Chicago Engineering Conference: Group at left (l. to r.): Burleigh Hutchins, Rust Engineering, Pittsburgh; John B. Calkin, University of Maine; Prof. Lyle C. Jenness, head of chem. engineering, U. of Maine; Richard Chase, assistant superintendent, mill technical department, Union Bag Paper & Bag Corp., Savannah; Harold R. Wheeler Jr., paper technologist, sales service dept., Clinton Foods Inc., Clinton, Iowa; James H. Davidson, chief engineer, Minnesota & Ontario Paper Co., Minneapolis; Edward W. Keith, soda mill superintendent, Penobscot Chemical Fibre Co.

In group at right (l. to r.): Henry Perry, industry consultant; Jack Dickson, Stowe-Woodward, Kalamazoo; John Lewis, head of paper engineering dept., Lowell Textile Institute; Raymond P. McGinley, chief engineer, Missisquoi Corp., Sheldon Springs, Vt.; J. H. Snyder, mill manager, St. Regis, Bucksport, Me.; Richard E. Durst, prof. chem. eng., U. of Maine; Irving L. Grodin, engineer, Moore & White Co., Phila.; Ralph M. Leighton, Stowe-Woodward Co., Newton Upper Falls, Mass. Present earlier, but not in pictures: William Hathaway, general supt. of paper mfg., KVP Co., Parchment, Mich.

THE MAINE SONG—IT WOOS STUDENTS

In one of the plush dining rooms of the Morrison, before a lot of delegates to the Engineering Conference had rolled out a bed for the day's program, the Maine alumni and Maine Foundation officials present for the meeting were summoned to a breakfast. Over coffee—and not over any Rudy Vallee steins, they talked serious business, and perhaps that was why there were no ringing choruses about "drink to all the happy hours, drink to the careless days."

Jack Dickson of Kalamazoo, Mich., class of '32, Maine, was chairman. Prof. Lyle C. Jenness, head of the chemical engineering department at Maine, revealed how a campaign among secondary schools, with speakers sent around, etc., had boosted freshman enrollment this year to 290 from 190, and one-half or more of these are expected to specialize in paper technology.

The breakfast also was a recognition of Prof. Jenness's 30th year at Maine and he said he had never before been so optimistic about the work being done to develop paper industry technicians and young executives.

Jack Calkin, New York engineer, discussed the Foundation and its fund, for which he is the secretary, and pointed out that "investments" in the fund by industries and individuals are tax deductible. There was some discussion of possible "pin-pointing" or special selection of favored scholarship students from mills, but it was explained the only fair policy was to keep the selections in the hands exclusively of the scholarship committee.

J. H. Snyder, manager of the St. Regis Bucksport Mill, spoke briefly and told of unusual assistance given to young students.

Of Maine by Adoption

Incidentally, Mr. Snyder and Prof. Jenness are "regulars" at affairs of Maine alumni, but neither one are graduates of the regular courses at Maine. They both graduated from the Univ. of New Hampshire, but Prof. J. went on to get a master's at Maine. Of course, being so close to Orono, Maine, Mr. Snyder has brought along quite a number of Maine graduates in his mill or helped them elsewhere.

Bucksport, incidentally, is the first mill to use peroxide bleach, and bleach groundwood and chemical pulp together. Now it uses a combination of the Dupont and Becco processes.

NORTHEAST NOTES

T. H. (TOD) MULLEN, former deputy director of Pulp, Paper and Paperboard Division, NPA, has assumed his new duties as APPA's Washington, D.C., representative. Mr. Mullen has had wide experience in the industry for over 30 years.

JOHN TRUSCOTT, production superintendent, Kimberly-Clark Corp., Niagara Falls, N. Y. has completed 25 years of service with the company.

PEN-JER-DEL SUPERINTENDENTS DIVISION elected these officers for 1952-1953: *GEORGE M. SUYDAM*, Riegel Paper Corp., chairman; *ANDREW J. LUETTGEN*, P. H. Glatfelter Co., first vice chairman; *CLARENCE F. KINGSTON*, Hammermill Paper Co., second vice chairman; *CLETUS D. COFFMAN*, Chesapeake Paperboard Co., third vice chairman; and *ALFRED M. HARTLEY*, Nopco Chemical Co., Inc., secretary-treasurer.

JOHN MARTINOVICH, assistant superintendent of Thomson (N.Y.) Mill of United Board & Carton Corp., has been appointed acting superintendent.

DON ESTEBO is the new plant engineer for the Wheelwright Division of The Mead Corp., Leominster, Mass. He transferred there from the Escanaba, Mich., Mead mill where he was assistant plant engineer. He is a 1947 class graduate of the University of Minnesota.

A-PLANT VS. PAPER MILLS?

Most of the pulp and paper industries in this country would not care much for being in the "shoes" today of The Mead Corp. and Chillicothe Paper Co., two industries of the pleasant little town of Chillicothe which for some years have given steady employment—more recently to upwards of 3,000 persons.

For one of the biggest federal spenders—the Atomic Energy Commission—is bearing down on them—fast and hard. A $1,200,000 atom plant just 20 miles away at Waverly, Ohio, is going to be built. Bigger than Oak Ridge, it will be a uranium refinery, separating Uranium 235 from 238, by gaseous diffusion, similar to the process at Oak Ridge.

But that isn't all. There will be three big power plants in the region to supply the plant, of 1,800,000 total kw., more than all New York City uses. It is the biggest power-generating system ever to be built in one piece—about $400,000,000 worth!

What's going to happen to the paper industries? The Waverly atom plant will require 20,000 employes on construction for four years, then it will have 4,000 employes when in operation. The paper mills have been assured "the going scale" will be paid and no more. But experience of other industries alongside these big government projects has usually pointed the other way.

It is feared not only mill workers, even storekeepers and other employes in regular needed services in town will be weaned away. On the other hand, the retirement plans which the paper companies have adopted, like many others, may hold at least their older employes. Steady work, indoor work, may help hold them.

At nearby Paducah, Ky., a similar government project had a history of strikes, of upward pushed pay scales.

A Citizens' Committee in Chillicothe is trying to assist in dealing with the many problems that will arise because of this giant moving in on them. Howard Laymon, technical director for Mead in Chillicothe, is secretary of this committee. Austin Storey, president of Chillicothe Paper, represents industry, and Russell McVicker, purchasing agent at Chillicothe Paper, represents the schools (long his personal interest).

They are tackling problems that might face other paper industries.

Accurate chip sizing • High capacity • Low operating costs

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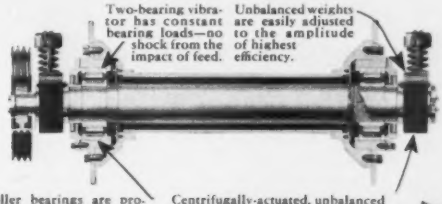
Yes... the efficient two-bearing operation of Link-Belt CA Concentric Action Vibrating Screens offers real economies in the screening of wood chips. Positive circular action of the vibrator provides quick bed stratification . . . maximum sizing opportunity for every particle. Sharp separation of slivers and sawdust is assured.

And you'll like the lower power and maintenance costs, thanks to two-bearing simplicity. If you are faced with a screening problem, call the Link-Belt office near you. A Link-Belt engineer may be able to offer you a money-saving answer.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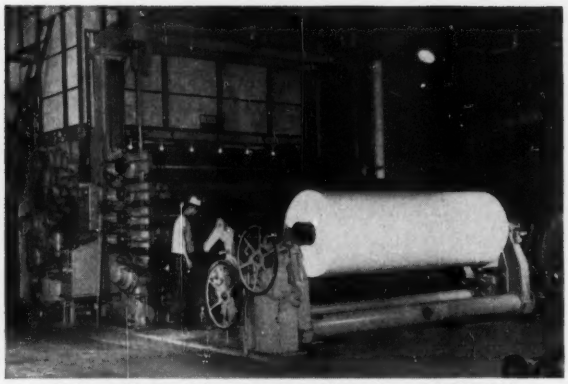
CLOSE SPEED REGULATION

wins duplicate installation for RELIANCE engineered paper machine drive . . .

This new single-motor Beloit paper machine, installed by the Detroit Sulphite Pulp and Paper Company in February, 1952, produces top-quality paper at operating speeds ranging from 450 to 1800 fpm. Power is furnished by a 300-hp. Reliance Type 'T' Heavy Duty Drive Motor, with speed control by Reliance V★S Drive. Under all operating conditions, over a 4-to-1 speed range, the Reliance drive system has consistently maintained speed regulation within ½ of 1%.

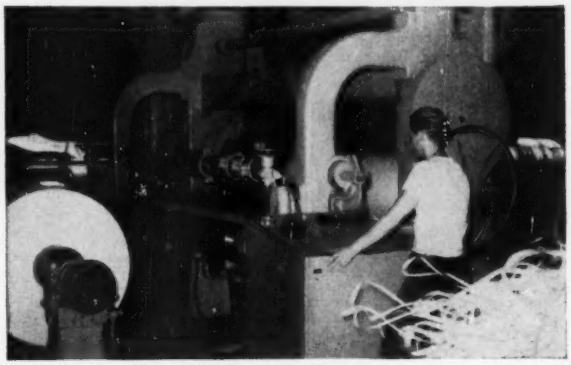
The management of Detroit Sulphite has been so well pleased with this performance that an exact duplicate has been ordered for a new machine to be installed early in 1953.

You can cut production costs and improve operation with a Reliance drive on your next machine . . . or on those you now have operating. Write for Bulletin D-2311, describing the Reliance V★S Drive . . . the original all-electric adjustable-speed drive for a-c. circuits . . . or call one of the Application Engineers at any of the 45 convenient Reliance Sales Offices.



Reel end of Beloit single-motor paper machine at Detroit Sulphite Pulp and Paper Company. High-quality paper is produced at speeds ranging from 450 to 1800 fpm.

Power for the main lineshaft drive is supplied by this 300-hp. Reliance Type 'T' Heavy Duty D-c. Motor. Reliance VSR Speed Regulator on the lineshaft maintains speed regulation within ½ of 1% over a 4-to-1 range.



Photographs courtesy of Detroit Sulphite Pulp and Paper Company

Auxiliary drives include this high-speed two-drum winder, powered by a Reliance 50-hp. winder motor. Two other 50-hp. Reliance motors drive the couch helper and the press helper.

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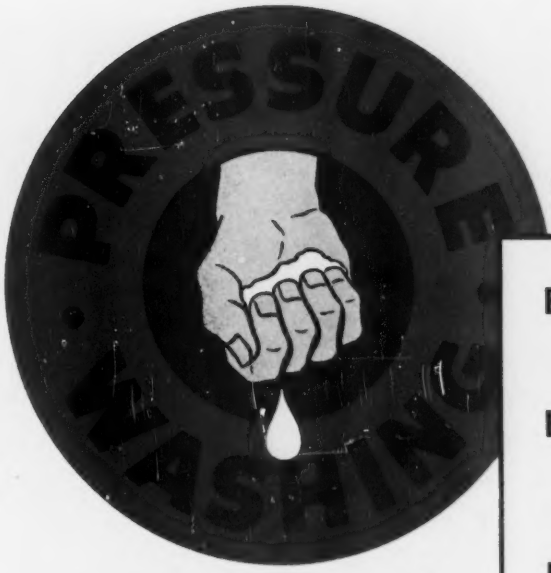

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Positive squeezing action assures uniform separation of liquor from pulp.

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Operating temperatures average around 210°F, using wash-water from 200–205°F, thus sending hotter black liquor to evaporators.

Reduced water consumption ✓

Less than 200 g.p.m. for a 300-ton system.

Low power requirements ✓

Actual horsepower consumed by a typical 3-stage, 300-ton system is only 1.36 per air-dry ton.

Ease of control ✓

Entire system is operated from a single switchboard. Output easily adjusted to mill requirements.

Flexible installation ✓

Small, compact units can be put in existing buildings with a minimum of alteration.

Low capital investment ✓

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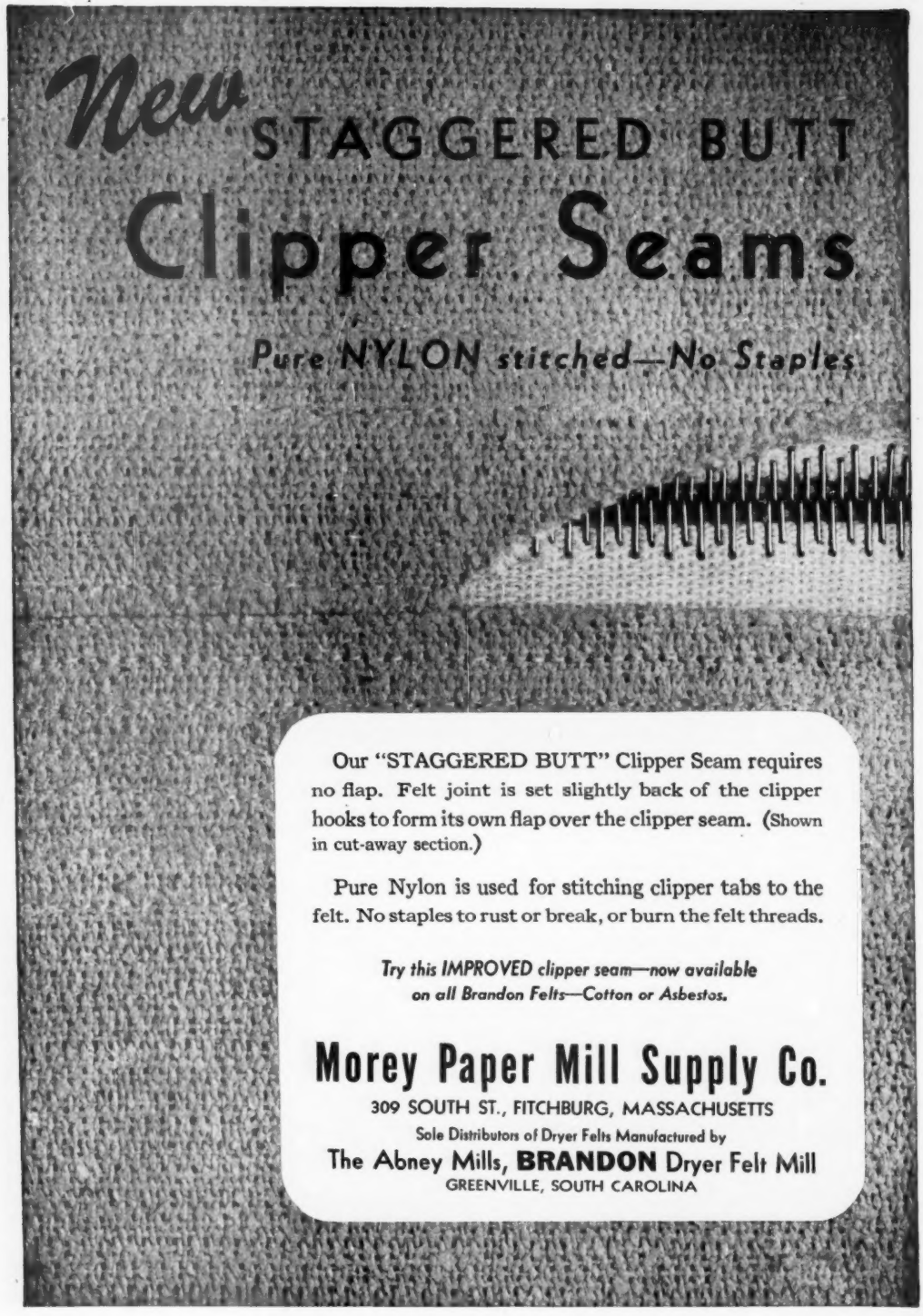
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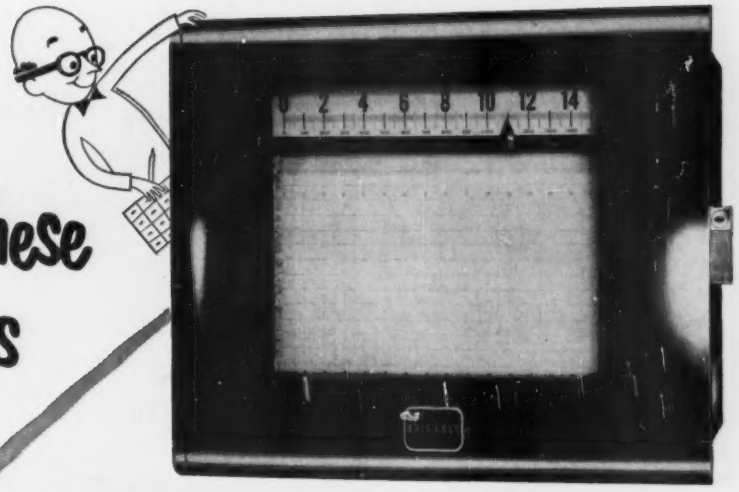

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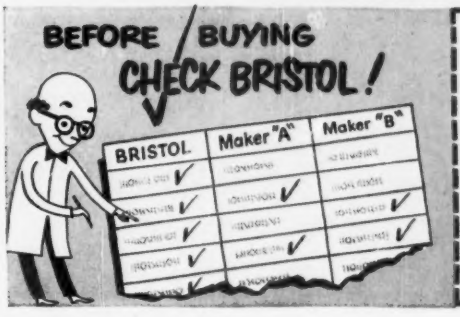

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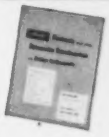

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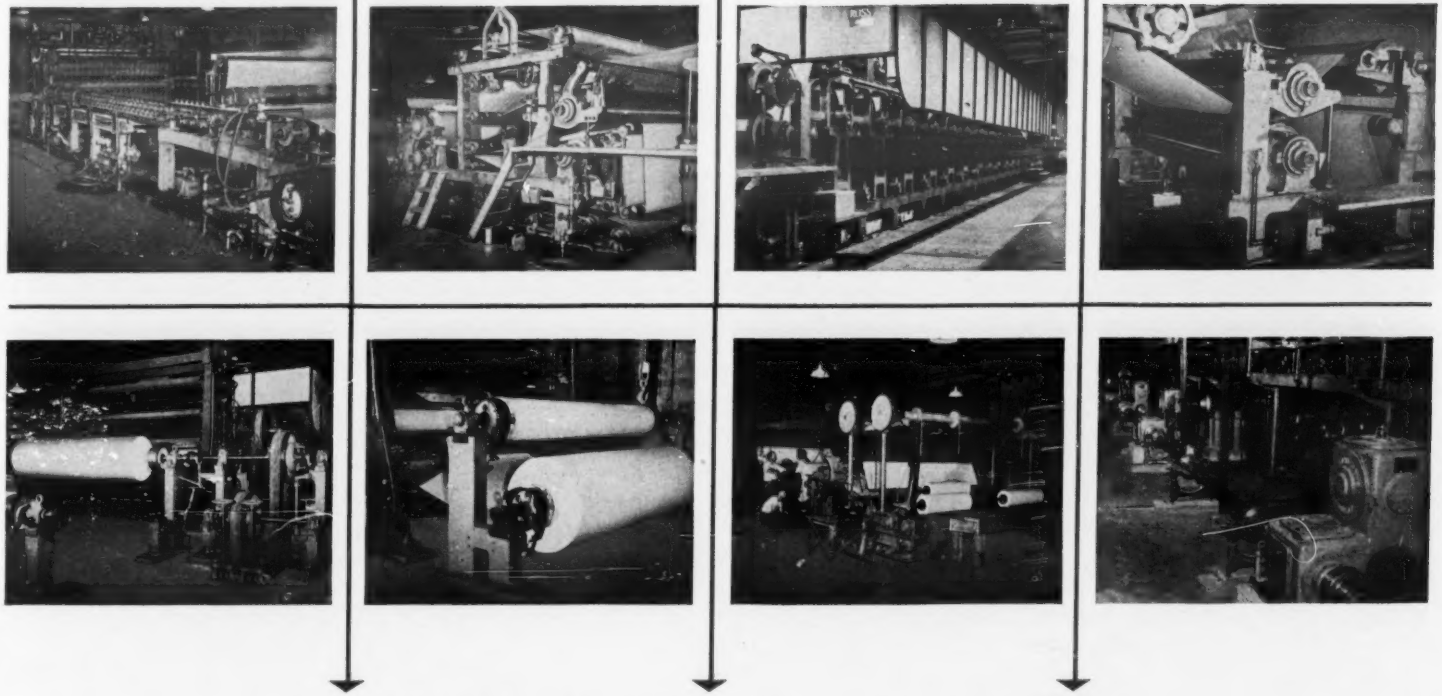
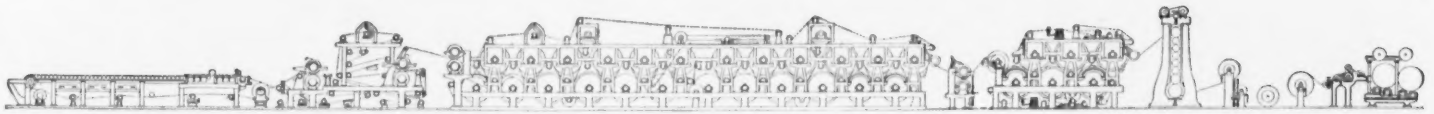


Latest Moore & White Fourdrinier machine with 136" wire operating on specialty grades at Hopper Paper Co., Taylorville, Ill. Above views show various machine sections and Moore & White Syco-type machine drive.



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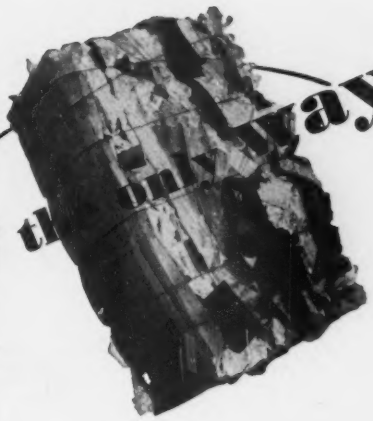

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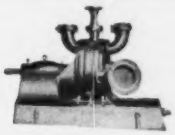

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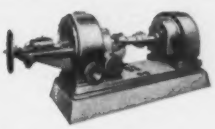

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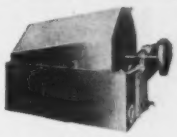

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Pulpwood section

PRODUCTION - MANAGEMENT

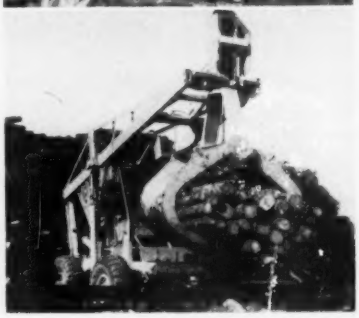
FULL REPORT OF LAKE STATES APA PULPWOOD MEETING

New Loading Methods —Debarking Operation —Long Truck Hauling

Debarking, tractor mounted loaders and long distance truck hauling were problems discussed and observed at the Lake States technical meeting of the American Pulpwood Assn. (Escanaba, Mich., Sept. 17-18).

More than 35 persons were on hand for the first day's field trip which began with Marathon Corp.'s chemical debarking operations at L'Anse and ended with a display of equipment at William Bonifas Lumber Co., near Champion, Mich. Here the group observed the operation of a Murrco Adams-Clark Debarker; several types of Pettibone-Milliken Cary-Lift loaders; a tractor mounted Dray loader; a Vercillion's-Ware pulpwood loader; and a skidder-loader called "The Loggers Combine."

The indoor discussion session at the Hotel Delta, Escanaba, compared chemical debarking results and findings, and discussed possible repercussions to the entire program of chemical debarking as caused by damage to wild-life. It was followed by a presentation disclosing the operational features and results of the three Murrco Adams-Clark Barkers owned by Marathon Corp., Mead Corp. and Consolidated Water and Paper Co. During the afternoon, small tractor-mounted pulpwood loaders and long-distance truck hauling were discussed.



TOP—VERCILLINO-WARE PULPWOOD LOADER being demonstrated at APA Lake States Meeting north of Champion, Mich.

MIDDLE—MURRCO-Adams-Clark Portable Barker in action at L'Anse, Mich.

BELOW—Cary-Lift Loader feeding live deck to the barker. These operations are fully described and discussed in this report on the APA Technical Committee's Meeting.

Murrco-Adams-Clark Barker

At Marathon's rail concentration yard near L'Anse, E. J. Anderson, Maraton Corp., demonstrated his Murrco-Adams-Clark Barker. Mounted on two long steel runners this barker, with an International diesel motor power-plant, it is loaded by means of the bolt conveyor section of an old Montague slasher saw. The gasoline engine powering this conveyor also powers a horizontal "live" deck, capable of storing 2-3 cords of 8 foot pulpwood. Intended as a semi-permanent installation, bark is carried away from the barker by an electric powered drag conveyor.

With a crew of two laborers, one operator, and a Cary-Lift-Operator production has reached 40 peeled cords per 8 hr. day, but normally averages 4 peeled cords per hour. Charges average one-half a cord for hemlock and .62 cords for spruce, fir and poplar. In dry hemlock, 95% bark is removed while dry spruce and balsam seldom exceeded a bark removal percentage of 85%. Normally, good results are experienced with wood cut and barked during sap peeling season.

Chemically treated hemlock, balsam, and white birch were put through the machine to demonstrate good barking qualities. It was necessary to score, lengthways of the stick, all white birch pulpwood placed in the barker. All wood had been poisoned one year ago.

This barking unit is serviced by a PMCO Model 5 Cary-Lift truck. Discharged peeled wood is transported 200 feet and deposited on the ground preparatory to loading into gondola cars by a Michigan ¾ yard truck-mounted crane. This Cary-Lift operates over a soft, spongy, bark-covered storage area while transferring rough wood from 20 foot piles to the "live" deck of the barking machine. In place of the usual loader, equipped with forks and a hydraulically controlled upper arm, Phil LeTendresse demonstrated an experimental Cary-Lift model equipped with a cord-capacity clamshell grapple. This grapple can be rotated about its vertical axis, swung in a vertical plane which is parallel to the arm assembly, and is mounted at the end of an extended arm assembly. A four-wheel-drive machine, an added feature is its four-wheel steer. This machine has loaded gondola cars at the rate of one every two hours on an operation which required the transporting of wood a distance of 2000 feet from storage pile to the car. One Cary-Lift truck now performs the duties previously performed by a skid loader and a truck.

Chemical Debarking Treatment

Traveling 19 miles to a treated area, this group observed results of a stand which had been chemically treated during 1952 spring and summer. 5400 cords on 400 acres had been killed with full strength solution of Atlas "A" (sodium arsenite) which had been applied by an 11 man crew composed of two supervisors, two tally men, and two painters, and five girdlers using McLeon Girdler and axes. Painters were equipped with Back Pack Pressure Tanks attached to 3½" fountain feed brush.

In observing these chemically treated stands of spruce, fir, hemlock, birch, and poplar, one member felt the killing of

(Continued on page 90)

APPA TOUR OF SOUTHERN FORESTS

AT SPEAKER'S TABLE at the banquet at the Hotel Buena Vista on Oct. 22, midway on woods tour were: (l. to r.) G. W. E. Nicholson, Union Bag & Paper Co.; Erling Riis, Southern Kraft Div., International Paper Co.; Vertrees Young, Gaylord Container Corp.; Earl Porter, Southern Kraft Division of IP; James L. Madden (committee chairman, who presided), Hollingsworth & Whitney Co.; E. W. Tinker, APPA; Sydney Ferguson, Mead Corp.; W. R. Adams, St. Regis Paper Co.; and Justin Weddell, St. Regis Paper Co.

TAKING APPA-SPONSORED FORESTRY COMMITTEE TOUR of Southern Woodlands were: Above, (l. to r.) J. T. Sheehy, Rayonier, Inc.; C. K. Andrews, Blandin Paper Co.; W. S. Bromley, American Pulpwood Ass'n.; Vincent Martin, Marathon Corp.; A. W. Miller, Cornell Paperboard Products Co.; Everett Ingalls, S. D. Warren Co. Below (l. to r.) R. W. Lyons, Kimberly-Clark Corp.; Harry M. Roller, International Paper Co.; C. G. McLaren, National Container Corp. of Wisconsin; George M. Snyder, St. Regis Paper Co.; J. L. Ritchie, U. S. Pulp Producer's Ass'n.; and E. H. Clapp, Panobscot Chemical Fibre Co.

Members of the forest policy committee of the American Paper and Pulp Association enjoyed a comprehensive tour of selected typical Southern woodlands operations on Oct. 22-23 under personal attention of top executives of St. Regis Paper Co., Hollingsworth & Whitney Co., International Paper Co.'s Southern Kraft Division, and Gaylord Container Corp. A PULP & PAPER editor accompanied the group and took pictures shown here.

The first gathering was at Pensacola, Fla., where the group were dinner guests of A. D. Pace, vice president of St. Regis Paper Co. On the following morning (22nd) the party embarked in two buses, being first presented with a printed booklet prepared for the occasion that showed the route and listed each "pause" and "stop." Each bus had a top woodlands man from local companies who furnished a well phrased summary of what was to be seen and answered questions.

The tour embraced everything in the positive efforts being made by the companies to induce a greater yield of pine forest, as also the negative efforts of public and small owners toward whom there

FIRST STOP (top left) on APPA-sponsored Forestry Committee tour of Southern Woodlands was at this 10-million pine seedling nursery of ST. REGIS near Pensacola, Fla. BELOW—A box lunch served at Ladner's Tree Farm by Gaylord Container Corp.

END OF TOUR (on right) was in famous Southern pine plantations of GAYLORD CONTAINER CORP. Talks about what they had seen were among late events of the conducted tour in big buses which the Forestry Committee made with its hosts.

PHOTOGRAPHED BY PULP & PAPER AT ST. REGIS PINE SEEDLING NURSERY are: (above—l. to r.) William R. Adams, Vice President, St. Regis Paper Co.; M. L. Madden, Board Chairman, Hollingsworth & Whitney Co.; and James L. Maddan, President, Hollingsworth & Whitney Co.

LOOKING OVER FOREST FIRE-FIGHTING AND SUPPRESSION equipment at Stop No. 2, St. Regis Paper Co. are: (below—l. to r.) C. L. Morey, Fibreboard Products, Inc.; Henry J. Malsberger, Southern Pulpwood Conservation Ass'n.; Frank E. Pearson, Jr.; St. Croix Paper Co.; and E. G. Amos, American Paper & Pulp Ass'n.

has been conducted an educational campaign as to the value of a "green" state and the profits to be derived from proper management.

The comparison of well stocked pine lands in Baldwin County, Ala., for instance, against over-cut and fire-ridden acres shown in southeast Mississippi furnished an effective evidence of what the Southern fight for control of fire has as its objective. The tour encompassed a nursery for pine seedlings at Pensacola, plantations of all ages and tree sizes, with the climax in the Gaylord pine plantation that dates in part from 1924.

The woodlands program in the South in all its aspects was outlined by speakers at a banquet held Oct. 22, at the Hotel Buena Vista, in Biloxi, Miss., and the application of how the scenes laid before them applied to the South as a whole was explained briefly at a lunch stop on Wednesday.

Much of this has been covered from time to time in special articles published in the Pulpwood Section of PULP & PAPER.

E. W. (Ted) Tinker, executive secretary of APPA, and Glen Amos of APPA, who directed the tour project acknowledge special assistance from these men: Frank Heyward, Jr., Gaylord Container; W. J. Bridges, Jr., Hollingsworth & Whitney; Earl Porter, International Paper; A. C. Shaw, Champion Paper & Fibre; Justin R. Weddell, St. Regis; Harry Roller, International; Louis Dantzler, International; Joe Burns, Hollingsworth & Whitney; J. R. McKee, St. Regis, and Henry Malsberge Manager, Southern Pulpwood Conservation Association.

Mechanization Talk At Eastern Woods Session

Greater mechanization will help reduce logging costs, a national expert told members of the Northeastern Section, American Pulpwood Association, and the North Eastern Pulpwood Research Centre Oct. 9, at Randolph, N.H. W. E. McCraw, of Caterpillar Tractor, told the logging men:

"It has been said that the past 20 years has been the paper mill era, the era of great innovations and spectacular improvements in paper mill machinery, and that the next 20 years will be the woods era, in which equally great improvements will be made in our wood operating methods."

Increasing mechanization will permit changing from short-wood to tree-length logging, McCraw said, and explained:

"There are good reasons for its acceptance by the logging industry. The method is fundamentally sound, it is more economical to move our comparatively small size Eastern timber in one big piece.

Mr. McCraw said he sees the tractor and sulky as the recommended method for tree-length logging and noted that two jobs in the Randolph area are employing that method.

Record Tree Planting

An all-time peak in Southern reforestation is expected this fall and winter, with the tree-planting goal set at 303 million seedlings.

According to a report released today by Southern Pine Association, 184 million trees were planted during the past season. The estimated current production would top all previous records.

AMONG THOSE TAKING APPA WOODS TOUR were (l. to r.) Downing P. Brown, of The Brown Co.; Frank Heyward, Jr. of Gaylord Container Co/p. and W. D. Comings, of West Virginia Pulp & Paper Co.

Half of Tennessee Is Growing Timber

Almost half the land in Tennessee is growing timber, according to a new forest survey by the U. S. Forest Service.

Considering all merchantable trees, Tennessee's forests are growing faster than they are being used, according to the findings. Ninety-one percent of the commercial forest land is privately owned.

Forests cover 12,600,000 acres of total land area of 26,900,000 acres. The most heavily timbered part is the Cumberland plateau and the Highland Rim section in the eastern part of the state, where seven acres out of every ten are in forest. Tennessee's supply of all merchantable trees of pole-timber size or larger totals 5 billion cubic feet.

Forestry Meeting Set For Victoria, B. C.

Personnel of this industry has been prominently programmed for the 43rd forestry conference session of Western Forestry & Conservation Assn., to be held Dec. 10-12 in Victoria, B.C.

Clarence Richen, chief forester of Crown Zellerbach Corp., will talk on "Inventory Problems for Intensive Management"; "Application of Diversified Production" is to be discussed from U.S. side by George L. Drake, vice president of Simpson Logging Co., and from Canadian view by Walter Koerner, vice president of Alaska Pine & Cellulose, Ltd. Topics of current interest scheduled include taxation, forest industry financing, research, full crop utilization, safety and coordination of fire plans.

Dr. C. D. Orchard, deputy minister of lands and forests of B.C., is president of the association.

Forest Land Holdings

Forest land ownership of Southland Paper Mills, Lufkin, Texas, has been more than doubled through acquisition of most of the stock of the Texas Long Leaf Lumber Co., operator of sawmills at Trinity and New Willard, Tex. The lumber company owns more than 200,000 acres of forest land. J. H. Kurth, Jr., is president.

Holdings of Southland Paper Mill as reported in the May, 1952, issue of PULP & PAPER, amounted at that time to 150,000 acres, which would bring the company's lands close to the 400,000 acre mark. In addition to the fee ownership, Southland draws pulpwood from 235,000 acres of land held by Southern Pine Lumber Co., and 285,000 acres held by Angelina County Lumber Co.

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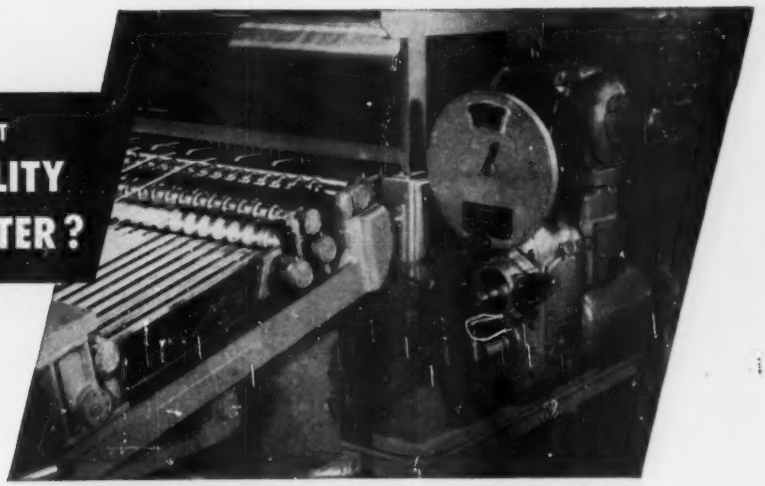

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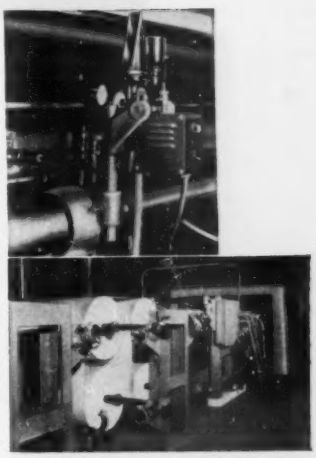
NEW DOWNINGTOWN

MASSON-SCOTT SUPER CUTTER & LAYBOY

Versatility in a cutter and layboy means that it can handle sheet size changes and stacking automatically with but few simple adjustments by the operating personnel. This type of versatility is available in the new Downingtown Masson-Scott Cutter and Overlapping Layboy. It is precision engineered for high speed cutting accuracy and is easily adjustable to meet special production problems.

Your Downingtown Sales Engineer will submit complete data about the Downingtown Masson-Scott Super Cutter and Layboy or write for Bulletin No. 252A.



(Above) automatic counter installed on a Downingtown Masson-Scott Super Cutter. (Below) Backstands with tension and positioning devices.

MODERNIZATION IS CONSERVATION

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Pacific Coast Representative: John V. Roslund, Pacific Building, Portland 4, Oregon

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DOWNINGTOWN MASSON-SCOTT SUPER CUTTER & LAYBOY

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J. R. KIMBERLY IS EXEC. V. P. OF K-C

John R. (Jack) Kimberly, grandson of James A. Kimberly, one of the founders, is the new executive vice president of Kimberly-Clark Corp., with headquarters in Neenah, Wis. Cola Parker, whose background is corporate law primarily, carries on as the president of the corporation.

Mr. Kimberly succeeds Ernst Mahler, but the latter continues as a director and consultant and alternate member of the executive committee. Mr. Mahler, famed as founder of the Institute of Paper Chemistry and TAPPI, served 38 years in K-C and steps down under required company retirement plan.

Mr. Kimberly's background is in both manufacturing and sales. He has served the company since 1924, except for 1940-43 when he was with World War II's War Production Board, of which he became deputy director. He has been K-C's vice president in charge of sales since. Since 1937 he has been on the K-C board and in that year became assistant general superintendent, serving until he went to Washington. He is one of the industry's best informed men on government relationships. He is a director of the Neenah First National Bank and one of his hobbies has been inland lakes boat racing.

Several other changes have been made in top ranks in K-C:

Henry G. Boon, has been designated vice president of industrial and public relations, and at the same time it was announced the scope of these activities will be extended. He was former v. p. of operations. Those latter responsibilities will now be shared by W. R. Kellett and R. W. Lyons.

A. G. Sharp succeeded Mr. Kimberly as v.p. for sales; J. B Catlin, general marketing manager, is made an assistant v.p.;

JOHN R. KIMBERLY (left), grandson of a founder, is new Executive Vice President of Kimberly Clark Corp. HENRY G. BOON (right), new Vice Pres. of Industrial and Public Relations. It was simultaneously announced that Kimberly-Clark will extend the scope of its industrial and public relations activities.

J. Leslie Sensenbrenner is secretary and John R. Whitney, treasurer, succeeding J. Frederick Hunt, who held both positions and will retire Jan. 1; and Edward Davitt, comptroller, also becomes assistant secy-treasurer.

Mr. Mahler said his years with K-C have been "thrilling" and, among other things, he remarked that "it has developed one of the most respected technical organizations in existence."

PULP STATUS IN BRITISH COLUMBIA

Most of British Columbia's market pulp mills are operating at close to capacity, although company executives admitted prospects for the first quarter term of 1953 were uncertain and might lead to some curtailment.

The two sulfate mills of MacMillan & Bloedel on Vancouver Island will operate at 100 percent capacity the balance of the year, but present intention is to drop to 80 percent during the first quarter of 1953. The M & B mill at Port Alberni produces unbleached kraft, while the Harmac mill on the east coast of the island uses a Swedish bleaching process. Sales have been well maintained, despite the fact that some United Kingdom paper mill customers have been on a restricted schedule in recent months. Expansion now under way at Harmac will double capacity by August 1953.

The two sulfite mills of Alaska Pine & Cellulose ltd., at Woodfibre and Port Alice have been on a 95 percent basis during the present quarter. Both produce dissolving and nitrating pulp, for which the market has been comparatively stable.

SUPERINTENDENTS IN SOUTH

The Roanoke, Va., meeting of the Southeastern and Southern Superintendents is now history, being held in early October, but it is noteworthy that it brought out about 300 despite rainy weather. Cecil Curry of Big Island, Va., and Jack Thompson of Lufkin, Tex., respective chairmen of the two groups and their aides, had a well-varied program with general and specialized talks, including a union leader and investment banker in its list.

The Mead mill at Lynchburg provided a country club smorgasbord and a tour of the mill, guests being welcomed by Paul Ellis, division manager. Syracuse alumni, led by Ed Root, Harry Weston, Walt Moorehouse and Bill Converse, got together for a breakfast.

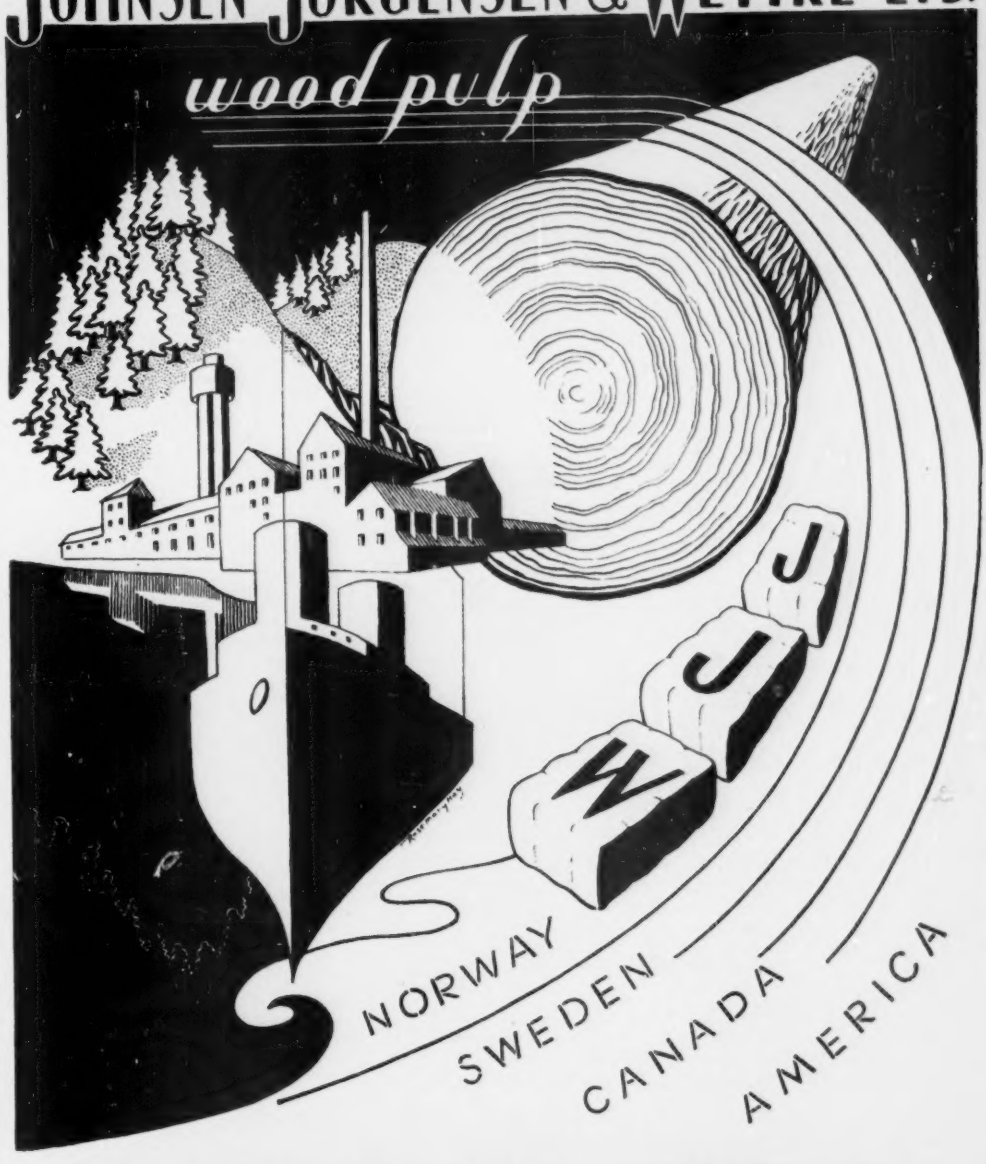
The Southeastern Supts. elected these new officers: Vinson K. Shannon, Mead Corp., Lynchburg (Chairman); Clyde G. Jones, Ecusta Paper Corp. (first vice chairman); T. R. Barnes, Champion, Canton, N.C. (Second vice chairman); Robert B. White, Sonoco Products Co. (third vice chairman); and M. L. Boinest, Jr., Albermarle Paper Mfg. Co., Richmond, Va. (secretary-treasurer). The Southern Division: Tom S. Coldewey, St. Joe Paper (chairman); R. W. Burnett, Crossett Paper Mills (first vice chairman); Charles McCarthy, Southern Paperboard Corp. (second vice chairman); C. A. Barlow Gulf States Paper Corp. (third vice chairman); and L. L. Griffiths, Jr., Draper Bros. Co. (affiliate representative).

M. L. BOINEST, new Paper Mill Superintendent at Halifax Paper Co., with Gene Bechard Memorial Trophy which he won at golf tournament of joint meeting of superintendents, Southern and Southeastern. Trophy was presented by A. A. Nyitray, Sales Manager of Eastwood-Nealley Corp., and this is the second year of award which was established in 1951 in memory of Gene Bechard, Southern representative of the company for 25 years, and considered an industry pioneer in the area. The trophy was won in 1951 by Ray McCormick, National Container Corp. Mr. Boinest moved to Roanoke Rapids from affiliated Albemarle Paper Mfg. Co., in Richmond, where he was Superintendent of Brown's Island mill.

AN OLD-TIMER AND HIS SONS (l. to r.): S. R. Brown, Sr., retired old-timer from North Carolina Pulp Co., is shown here with sons C. C. Brown, of H. Waterbury & Sons, and S. R. Brown, Jr., National Container Corp.

KENNETH YOUNGCHILD, American Cyanamid Co., who has recently moved to Mobile, Ala., to head up Southern division for his company, renews old acquaintance with PHIL HANNON, Southern Advance Bag & Paper Co., Hodge, La.

JOHNSEN JORGENSEN & WETTRE LTD.



26, FARRINGDON STREET, LONDON E. C. 4

TELEGRAMS: "WETTRE, LONDON."

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Wood Conservation is an Important Aim of the Paper Industry

ONLY two saw cuts saved per stick means approximately a half inch of wood. This seems like a small figure but becomes an astounding one when calculated for the vast amount of wood consumed in the mills today. Norton is building the pulpstones to make this saving possible — stones 66" wide and 69" wide for grinders with a power input up to 5000 horse power.

The engineering skill and experience which developed these giant stones are ready to study your pulp problems and give you exactly the right stone to meet your particular needs — the correct abrasive, grit size and grit spacing to produce from your wood just the kind of pulp you require.

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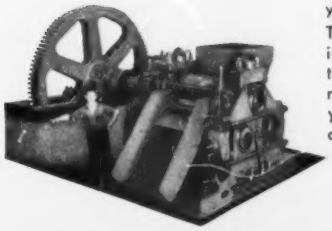
the FULTON ROLL PRESS can add 25,312,000 BTU's hourly to the fuel value of your bark!

This saturated bark, as it comes from the barkers of a large paper mill, contains 70% moisture. This cuts its effective fuel value from 8,500 BTU's per pound (the average for dry bark) to only 5,582 BTU's per pound. *The other 2,918 BTU's are wasted in evaporating the moisture.*

Here is the same bark after processing in the FULTON ROLL PRESS. Its moisture content has been reduced in a few seconds from 70% to 47%—*raising its fuel value from 5,582 to 7,390 BTU's per pound.* Note, too, how the large pieces of bark have been reduced to small particles of even-burning fuel—*assuring much more efficient combustion.*



Since the FULTON ROLL PRESS will dewater and reduce 6 to 7 dry tons of bark per hour, it can add up to 25,312,000 BTU's to the fuel value of your bark every hour it operates!

The FULTON ROLL PRESS does an equally profitable job on knots, tailings and other mill waste—all in one continuous, low-cost operation that makes costly, inefficient "batch" methods obsolete. If this test report still hasn't convinced you that a FULTON ROLL PRESS belongs in your mill, let us *prove it* by processing a sample of your material without obligation.

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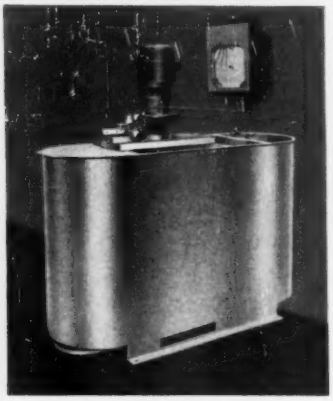
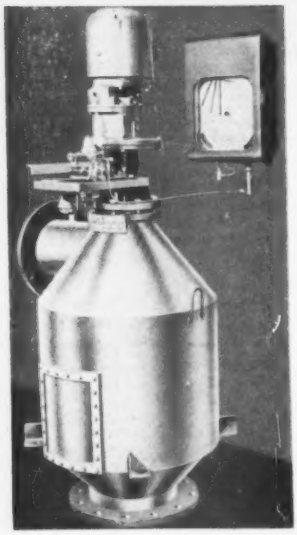


In more than 1000 installations, DeZURIK REGULATORS keep piling up proof of their complete efficiency in consistency-control at many process-stages. Their traditional superiority is now enhanced by 24-hour FULL-RECORDING function with Instrumentation Control, delivering a precise, lucid stock-system picture around the clock. DeZurik Regulators handle any assignment with ease. They are remarkably sensitive and accurate, yet extremely simple, and demand an absolute minimum of attention. They reflect long years of engineering experience ... and they reflect them in added mill profits!



3 VERSATILE TYPES

STUFF-BOX TYPE (Above)

The ideal regulator for basis weight control. Sets new standards of accuracy. Wide range of box designs to fit every requirement.

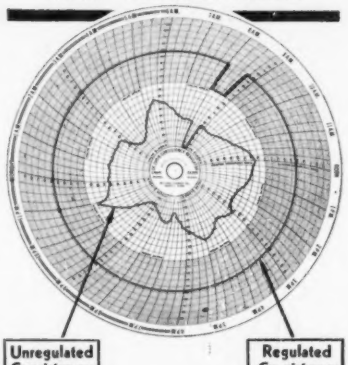
PAN TYPE (Above left)

Installed directly after washers, deckers, save-alls, etc., to make their operation fully-automatic. Regulates gravity-flow to chest without pumping. Saves cost of extra chests and pumps. Shower water is controlled by regulator.

PIPE-LINE TYPE (Left)

The one successful solution to the problem of producing uniform consistency in an enclosed system. Handles full volume being pumped without return overflow. No chest dilution; piping is simple and direct. Widely used on pressure refining, stock transmission and similar systems.

A GRAPHIC RECORD FOR EVERY 24-HOUR PERIOD



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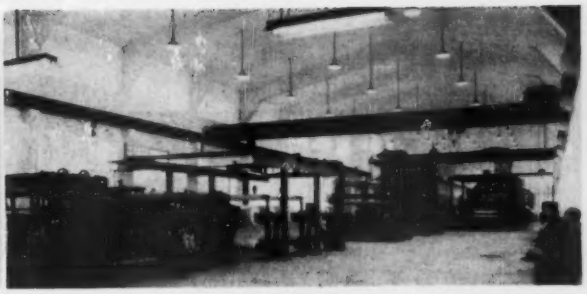
Write for New Regulator Bulletin

GENERAL VIEW OF MODERN SPECIALTIES Paper Machine designed and built by Sandy Hill Iron & Brass Works for Fabrica Nacional de Papel in Puerto del Sauce, Uruguay. It is 122 in. wide, produces about 30 tons a day of wide variety of fine papers. Bird Machine Co. 3 A 100-in. rotary screen in foreground, at right. Ross Engineering supplied hood and exhaust system.



VIEW OF NEW FINISHING ROOM of Fabrica Nacional de Papel in Uruguay, looking toward Paper Machine. From left to right, this shows Hamblet cutter with backstands; Holyoke Machine Co. Supercalender with Sandy Hill selective drive; Cameron Machine Co. Rewinder and three motor electric cranes from Manning, Maxwell & Moore; and—finally—dry end of machine.

URUGUAY'S FABRICA NACIONAL, S.A.

Although the new modern paper mill and additions at Fabrica Nacional, S.A., on the bank of Uruguay's great Rio de la Plata, near Montevideo, started up in late 1949, and some reports of it were published in this country at the time, we are publishing on these pages a number of new pictures—showing for the first time some of its American machinery.

We are indebted to V. Laqueur for this interesting history prepared for PULP & PAPER:

"The founder of the paper industry in Uruguay was D. Nicolas Calcagno, an Italian immigrant, who like many others on the Rio de la Plata, was in maritime business. But in 1883, when he went to France to enter his sons in school, he brought home two French paper technicians with plans for a new industry.

"The mill was built in a zinc-roofed shed near the sea on Pocites brook and it took intervention of a governor to prevent the inhabitants from damming the brook and from ousting the plant, which started up in 1885. It never made more than 500 kiles a day.

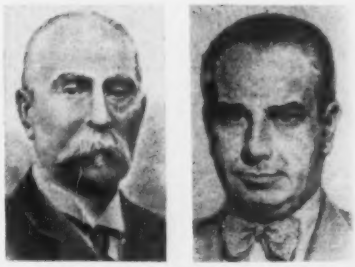
"Sr. Calcagno's plans for a bigger mill with better water supply were frustated in the 90's by a depression and revolution. Meanwhile he sold his Pocites mill. In a new company, in which he and several others joined, the old Pocites mill was brought back in 1898 and machines were moved to Puerto del Sauce.

"One of his sons, Santiago A. Calcagno, who became Uruguayan Minister of Public Works, was in charge of technical problems, and to him goes credit for wise planning of an industry which after 15 years of changing luck, finally was established. There were two Fourdrinier machines, rag cutters, grinders, refiners, supercalender and automatic paper cutter, started up in May 1899. It used wheat straw, reed, cane, pita, later hemp and cotton. Great quantities of seeds were distributed to farmers of Colonia. Woodpulp was imported. Even then the directors, expressed hope they one day would obtain pulp from 'the valuable woods of this country.' The mill employed 150.

"In 1913, the original company, Cavajani, Puppo, Badi & Co. was changed to a stock company—Sociedad Anonima—and became Fabrica Nacional de Papel S.A." with capital of 840,000 pesos.

"In 1927 an electric power plant replaced the old steam driven units. In 1935 a new Fourdrinier machine for light papers was added. In 1941 Uruguay's first pulp mill—a 20 ton Pomilio process mill using straw, was started up. After the war, plans for a No. 3 machine and complete new modern mill for writing and printing papers were made and this is the machine which started up in 1949, making F.N.P. one of the largest producers of fine paper from bleached straw in the world."

The authorized capital of the company is now 10,000,000 pesos. The president, Juan Carlos Raffe Fravega, the vice president, Eduardo J. Calgagno, the secretary. Roberto J. Zerbino; and other board members, Carlos Sanguinettian and Hugo A. Baldi, are descendants of founders, direct or by marriage.



NICOLAS CALGAGNO (left), Founder of Uruguay's Paper Industry. An Italian pioneer of the country, he went to France and brought back two technicians and built the first mill in a zinc-roofed shed near Pocitos in 1885. With others, in 1897, he founded the company which became Fabrica Nacional de Papel.

JUAN CAROLS RAFFO FRAVEGA (right), a son-in-law of one of the Founders (Jose Puppo), is now President of the company which has a new modern straw paper mill addition.

"THE FOUNDER'S BELL" of Fabrica Nacional de Papel at El Sauce, Uruguay. It shows date of founding of the modern company in 1913, and installation dates for Machines No. 1, 2, and 3. These are October 1914, February 1935 and Sept. 1949. In this REVIEW we publish many new pictures of that latest machine for the first time.

Equipment in New FNP Mill

Design and layout of the entire new mill was by Sandy Hill Iron & Brass Works, Hudson Falls, N.Y., and it supplied all equipment.

Various kinds of pulp are fed into a 10 ft. Shartle-Dilts Hydrapulper. Via huge chests and agitation, the pulp goes to two Noble & Wood Victory Beaters and Noble & Wood jordans on the machine floor. All pipe and fittings here are stainless steel and there is one-man supervision of automatic stock preparation. Goulds Pumps handle stock and water.

Bird screen and Bird Dirtecs systems precede Sandy Hill-Bertrams flow control system, with primary Neilson slice and plain secondary slice to control heavy stock. This entire unit is stainless steel. A non-removable shaking type Fourdrinier with speed range to 500 f.p.m. and Sandy Hill-Bertrams shake is next. Wire guide is Gilbert & Nash. A special watermarking dandy roll and plain dandy fellow. All

VACUUM PICK-UP ARRANGEMENTS

Engineered to meet your needs...

Following the first installation several years ago on a machine manufacturing light and medium weight Kraft papers, the use of the so-called "vacuum pick-up and transfer" has grown by leaps and bounds until today many installations have been made and many more are under construction for operation on newsprint, waxing, and other grades.

The automatic handling of the sheet from the wire to the press felt, instead of the conventional handling methods, permits safe machine operation at considerably higher speeds with a resulting increased production.

In the case of newsprint, the quantity of chemical pulp content may be reduced substantially.

Puseyjones have built and supplied this arrangement for two new machines and have one under construction for an existing machine.

As with all new ideas, refinements and changes have been made since the original installation. As a result, several arrangements may be used depending upon space limitations, product requirements and other considerations.

Whether you are interested in this equipment for a new machine or modernizing present equipment, Puseyjones engineers are at your service.

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Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products.
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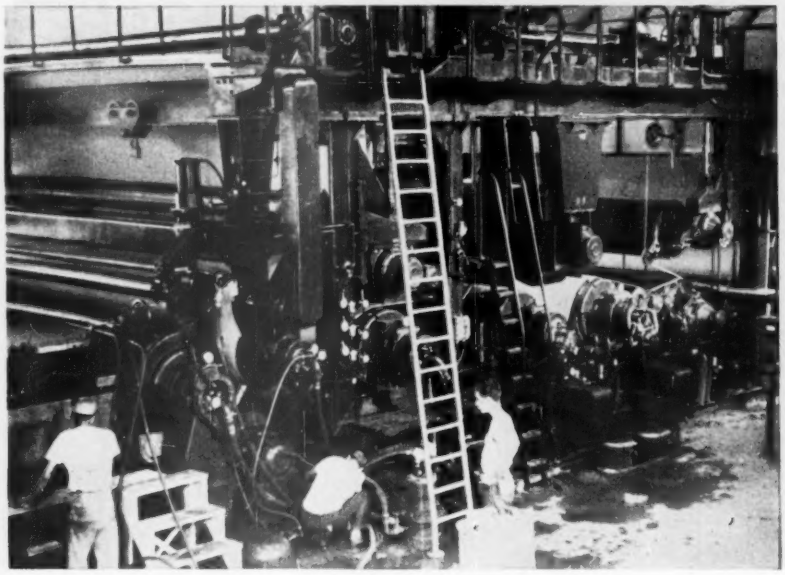


Illustrated at left is actual installation of Vacuum Pick-Up Arrangement on 236" Machine.

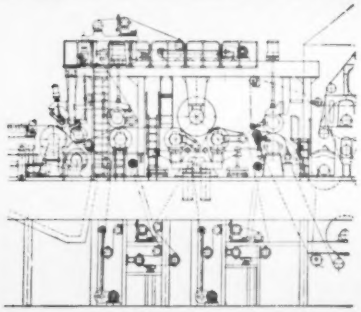
Line drawings (left to right) show:

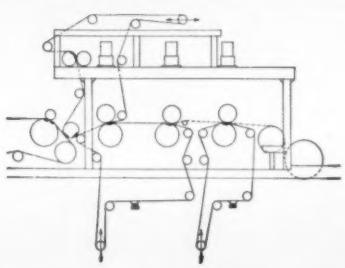
Original arrangement with Transfer Press and combination 3-Roll Main Presses (Cloverleaf).

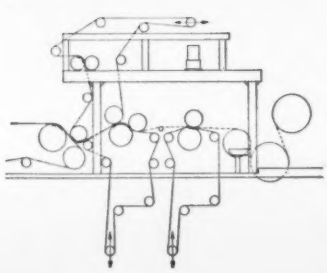
Modified arrangement with Transfer Press and conventional Main Presses.

Modified arrangement with combination Transfer and Main Press (Multipress) and conventional Second Press. Minimum space required.

THE SIGN OF TRADE MARK SUPERIOR QUALITY



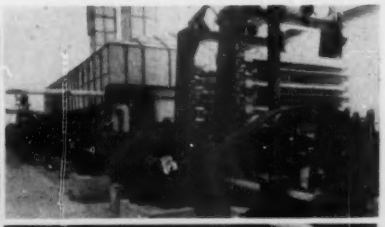


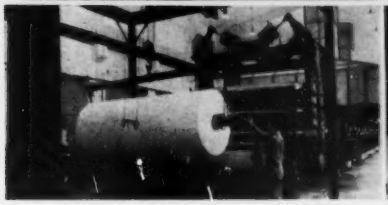


RELIANCE ELECTRIC & ENGINEERING CO. of Cleveland, O., 350 h.p. motor generator set for main drive of Fabrica Nacional's new machine in Uruguay.

TWO NOBLE & WOOD MACHINE CO. Victory Beaters with tile lined concrete tubs prepare straw pulp at Fabrica Nacional.

SANDY HILL IRON & BRASS WORKS Selective Drive at back side of Fabrica Nacional Paper Machine, including view of open Side Calender.





REEL OF PAPER being removed at dry end of latest machine for Nacional in its Puerto del Sauce Mill. Dryers have Stickle Steam control.

NASH ENGINERING Vacuum Pump in foreground, SULLIVAN air compresser and ROSS ENGINEERING bottom felt apparatus in background. (Ross supply system.)

SORTING TABLES with women employes in work uniforms in a fine new airy and well lighted room at Fabrica Nacional Mill in Uruguay.

parts touching stock are non-corrosive metal.

All rubber-covered rolls were by Stowe-Woodward, Inc. A 24-in. suction counch was supplied by Downingtown Mfg. Co. There are three main presses with Foxboro pneumatic loading and control and automatic Gilbert & Nash felt guides. Sandy Hill bronze lined bearings are on two 60 in. and 23-48 in. dryers. There are four 48 in. felt dryers. Two special 24-in. colling dryers are at the end of the dryer section. Lodding doctors are used. Sandy Hill stacks and calender, Sandy Hill Pope reel, Cameron winder, Holyoke Machine supercalender, and Hamblet cutter and Morse scale follow.

Reliance Electric & Engineering Co. supplied a 350 hp. motor generator as motive power for the machine and a Reliance D. C. motor as a prime mover. There are 11 right angle Sandy Hill selective reduction units.

J. O. Ross Engineering supplied machine hood and exhaust system and also a bottom felt supply system. The hood is of standard asbestos board panels on iron frames. Two hood outlets terminate at the roof line where there are two penthouses housing fan and one of motor and drive. High humidities cause three or four times as much air to be handled as would be the case in the U.S.A.

Hudson Gets Certification For Work At Kennebec

Certificate of necessity has been granted to Hudson Pulp & Paper Co. for 40% of a $870,000 program of improvement planned for its Kennebec Division at Augusta, Me. Of the amount, $80,000 will be for building improvement, and $790,000 for complete re-building of No. 2 paper machine, Hudson officials say. Installations include Yankee dryer, complete new press and dryer rolls.

DR. JUAN SWOBODA, of New York and Buenos Aires, who is South American Representative for Sandy Hill Iron & Brass Works, who assisted PULP & PAPER in obtaining news of Fabrica Nacional's new operations.

MILLARD E. HAYES Jr. (left), Sandy Hill Erection Engineer in charge of new installations in Uruguay, and (on right) RODOLFO REINBACHER, Technical Manager of Fabrica Nacional de Papel, at Puerto del Sauce.

LATIN AMERICA... FROM HERE AND THERE

Newsprint was not produced in Argentina in 1951 except for about 2,000 tons of rotogravure paper. The reason for this lack of newsprint production may be attributed to the fact that the price differentials which the Government was prepared to allow made production unprofitable.

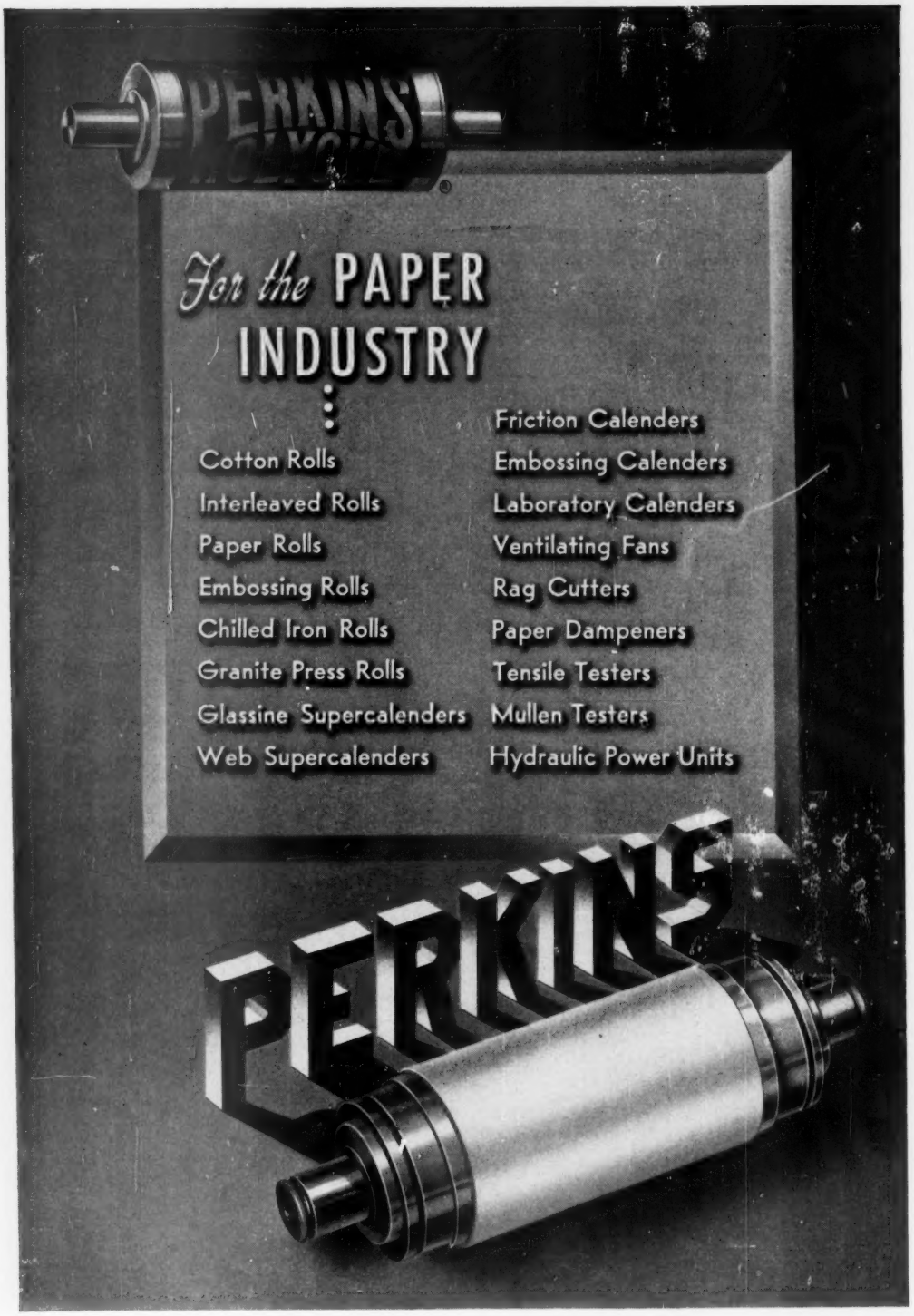
The Peruvian paper industry is virtually monopolized by two companies. One firm, operating a plant at Paramonga, manufactures paper and cement bags. Products of the other firm, the plant of which is located in the city of Chosica, include paper, gray cardboard, and asphalt roofing. Both plants have been modernized and expanded within the last year. Total production in the two plants was about 9,000 metric tons in 1943.

Dr. G. Raimondo, technical director of Cellulose Development Corp., recently addressed the University of Santo Domingo on the possibilities of paper production in the Dominican Republic. He was visiting the island on a Government contract to study the possibility of erecting a paper mill in the country, and he gave it as his opinion that all the paper consumed in the Republic could be produced economically on the spot, largely from sugar-cane bagasse.

Five tons of bagasse are being tested at the corporation's laboratory and pilot plant in London, following which a definite project for a pulp and paper mill will be submitted to the Dominican Government.

A report on Venezuela states that a Spanish Basque manufacturer, Senor Jose Maria Aranguren, visited Venezuela in Nov. 1951 and said that he would invest 10 million bolivars in building a mill for making paper and newsprint and would use bagasse. He suggested that the mill might have an output of 6,000 tons a year and that the site would probably be in Caracas. Nothing further has been heard of this project.

At the request of the Paraguayan Government, the Food and Agriculture Organization of the United Nations recently sent an expert, H. Recart of France, FAO's staff at Rio de Janeiro, to plan a forestry mission which will help organize the first forest service in that country.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Granite Press Rolls
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PERKINS

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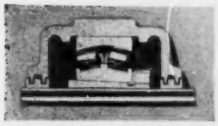
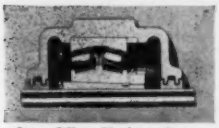
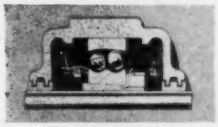


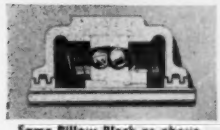
"Free" Spherical Roller Bearing.



Same Pillow Block as above, Bearing "Held" by stabilizing ring.



"Free" Ball Bearing.



Same Pillow Block as above, Bearing "Held" by stabilizing ring.

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- Stabilizing ring between the housing shoulder and the bearing insure fixed position of one held bearing on the shaft and prevents end movement of the shaft.
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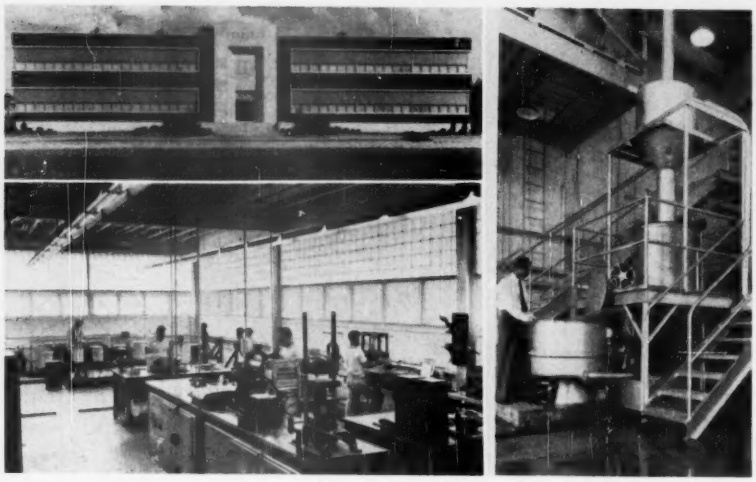
SOUTH'S NEW LABORATORIES



GENERAL VIEW OF NEW $400,000 RESEARCH LABORATORY (above—left) opened in ceremonies at Mobile, Ala., for International Paper Co.

Below—Interior view of Paper Research and Development and Pulp Bleaching Area. Picture at right—Pilot plant equipment for Pulp Making.

A $400,000 laboratory basic research for development of new pulp and paper grades from Southern forests, was dedicated Nov. 6 at Mobile, Ala., by Erling Riis, vice president and general manager, Southern Kraft Div., International Paper Co.

The new building is probably the most modern and completely equipped pulp laboratory in the South, Mr. Riis said.

The department is headed by John W. Gilbert, director of research, and G. S. Mabrey, associate director of research. Location of the new building adjacent to division offices permits close coordination with manufacturing and engineering programs. The research staff includes 40 scientists and technicians.

Three pulp pilot plants and laboratories for chemical analysis, chemical research and physical research are in the new building, as well as three controlled humidity rooms and facilities for photographic research and standard testing.

More and more, the work of the laboratory researchers is being coordinated with the work of the forestry and wood procurement departments, Mr. Riis said. Among studies are investigations of the effect of wood storage on yield and pulp quality.

"Nothing is more important to the growth of the paper industry than a sound research program," he said.

The pulp preparation pilot area is equipped for making unbleached pulp by any process. A type 316 stainless steel stationary digester with a capacity of about 4 cubic feet is equipped for direct or indirect cooking. A laboratory Bauer refiner and Abbe ball mill are provided for semichemical pulps and for studying refining characteristics of other pulps.

The pulp purification pilot area is equipped with a Valley Iron Works laboratory flat screen, constant temperature water baths, a 12-inch centrifugal and earthenware and stainless steel containers for bleaching.

The paper development area equipment consists of 1½ pound Valley laboratory beater, British sheet machine, a standard disintegrator, press and a Noble & Wood rotary drum sheet dryer.

The dissolving pulp pilot area contains four complete sets of equipment for processing dissolving pulp by the viscose procedure up to spinning.

The pulp evaluation laboratory equipment includes a 1½ pound Valley beater, a British sheet machine and a standard disintegrator.

Three laboratories are provided for the physical testing of paper; all three have controlled temperature and humidity.

An optical laboratory contains two Bausch and Lomb microscopes; one is a stereoscopic wide field microscope, while the other is a regular laboratory microscope equipped with an illuminator and polarizing accessories.

An analytical laboratory is equipped with the normal laboratory equipment required for analytical work, such as balances, ovens, distillation equipment, extraction equipment, pH meters and glassware.

Three general chemical laboratories are provided for carrying on research and development work.

Hollingsworth & Whitney And I. P. Divide Lands

Division of fine timbered acreage of Jackson Lumber Co., Lockhart, Ala., between the International Paper Co.'s Southern Kraft Div., with headquarters in Mobile, Ala., and the Hollingsworth & Whitney Co. mill in the same location was effected through a shewdly maneuvered acquisition deal.

The lumber company, stock in which was held by the Crossett-Watzek-Gates (Chicago) interests, held in 1949 more than 78,000 acres for forest classified as "tree farm." The lumber company had followed a conservative cutting practice for many years, and trade circles indicated the lands were carried on the books at a very nominal valuation. The liquidation of the company was effected by acquisition of its stock by the two paper companies, then the exchange or surrender of the shares of stock to the company for its physical assets. The lumber company was then dissolved. In this manner the owners of the stock disposed of, faced the capital gains tax under income levy without having experienced the application of profit under income tax that would have been levied had the company sold its holdings, then dissolved. The transfer of record specified the two paper companies were of "equal interest" in the transaction.

ERLING RIIS (left), Vice Pres. and Gen. Mgr. of Southern Kraft, I.P., who dedicated new $400,000 Research Lab at Mobile, describing it as South's best equipped; JOHN W. GILBERT, Director of Research for the division since 1946, a graduate of U. of Alabama and former chemist at Moss Point, Springhill and Bastrop Mills; and GUTHRIE S. MABREY (right), Assistant Director of Research, also since 1946, and also a graduate of U. of Alabama, who formerly was chemist at Mobile.

Personals

SOUTHERN NOTES

WILLIAM P. HICKS has been appointed vice president, General Sales Division of Gaylord Container Corp. He has been associated with Gaylord since 1937, year the Corporation was organized.

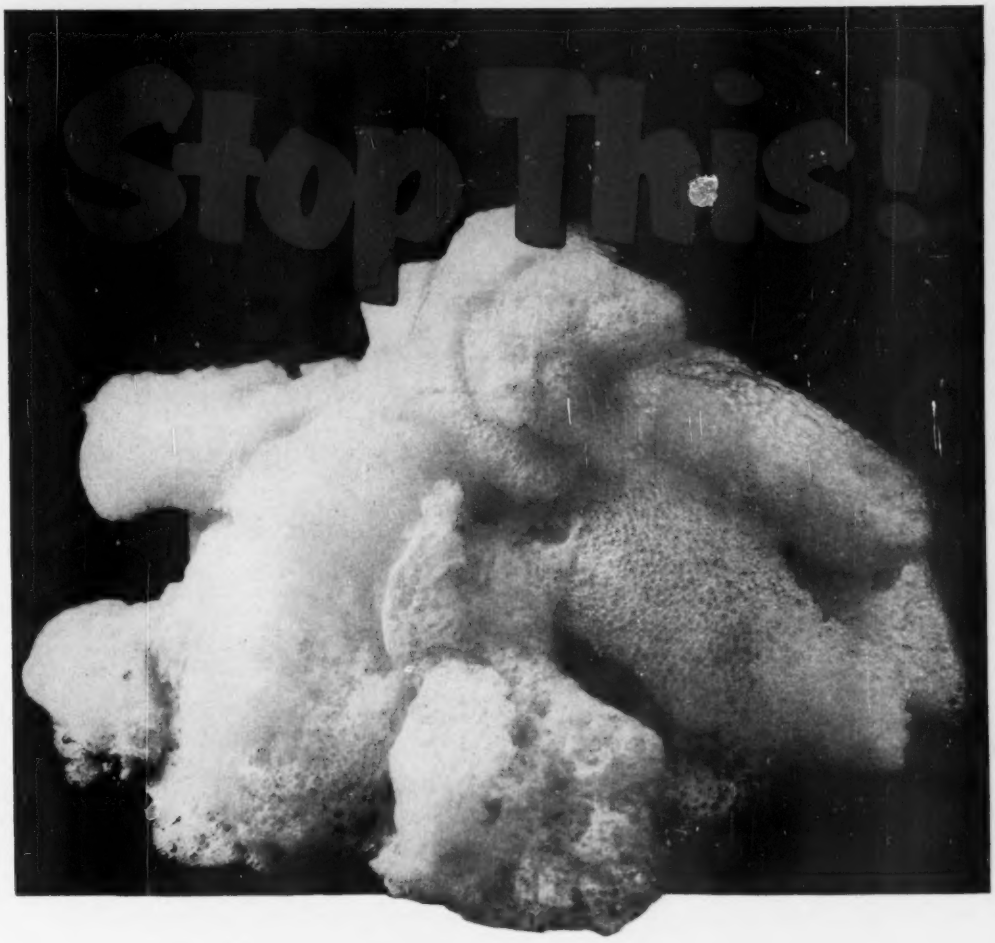
WILLIAM C. RINDSLAND is the new resident engineer of Rayonier, Inc., Fernandina, Fla. Mr. Rindsland is a University of Minnesota graduate. He served as plant engineer at the International Falls Division of Minnesota and Ontario Paper Co. prior to joining Rayonier.

CAPT. RICHARD C. HUTCHESON, Union Bag, Savannah, Ga., recently accepted key to the city on behalf of Savannah and Chatham County armed forces reservists who were called to active duty.

D. V. HILL is chairman of Publication Committee, Pulp Manufacturing Division, National Safety Council. He is safety director for Mead Corp. at Kingsport, Tenn.

EDWARD N. CROOK, president of the Crook Paper Box Co., North Kansas City, Mo., has completed 50 years in the paper box industry. He was born in Brush Creek, Tenn., and began his long career in 1902 in Nashville, Tenn.

WALTER A. KRUEGER, Fort Howard Paper Co., Green Bay, Wis., has been appointed district representative with headquarters at Houston as a result of the expanding industry and business of this area. He is a University of Minnesota graduate.



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SIZING MATERIALS AND CHEMICALS FOR PAPER

PP52-8

A Catalytic Oxidation Procedure for Determining

SULFUR COMPOUNDS IN KRAFT MILL GASES

By
H. W. Bialkowsky,
Research Director,
and
Gerritt G. DeHaas,
Research Chemist,
Of the Pulp Division, Weyerhaeuser Timber Co.

This is a condensation of one of the outstanding papers given at the International Tri-Association Convention, Victoria, B. C., Sept. 26-27, 1952. The complete paper will appear in technical journals.

Weyerhaeuser Timber Co. has been one of the leaders in the industry in kraft odor control progress. See article by Mr. DeHaas in Dec. 1951 issue, PULP & PAPER, page 70. Also Bergstrom tower article, Feb. 1951, page 56.

The evaluation and control of sulfur losses in sulfate pulping and recovery operations have been limited by the availability of adequate and convenient testing procedures. These sulfur losses are the source of the serious odor nuisance problems associated with this type of pulping operation. It has long been known that the objectionable gases which cause kraft mill odors are primarily hydrogen sulfide, methyl mercaptan, and dimethyl sulfide, along with oxidation products of the same. These compounds can be detected by the human sense organs in extremely dilute concentrations. Thorough investigations by the U. S. Public Health Service have shown that the odor threshold detection values of hydrogen sulfide, methyl mercaptan, and dimethyl sulfide are 1.1 micrograms per liter. This is somewhat less than 1 ppm on a weight basis. These figures become more readily visualized when we consider that if 1 lb. of these materials is evenly dispersed in an air volume over 1 acre in area to a height of 300 feet, they could still be detected by the sensory organs.

There are many conflicting reports in the literature and opinions vary among operators as to the intensity, immediate source and kind of the various materials contributing to the kraft mill odor problem. However, this may be due to the efficiencies of the various types of equipment used in different plants and the methods of operation. In general, the main source of odors are the furnace stack gases, the digester relief and blow gases, the lime kiln gases, and the non-condensible gases from the evaporators. Organic sulfur compunds such as methyl mercaptan and dimethyl sulfide are produced as side reactions during the latter part of the pulping operations. These organic sulfur compounds have very high vapor pressures and they readily escape to the atmosphere during digester relief and blowing and under conditions of stock manipulation and liquor evaporation. Some of these materials are partially condensed with the steam and appear in the digester relief and blow condensates and also in the evaporator condensates, but the balance escapes to the atmosphere in the form of non-condensible gases.

The recovery furnaces coupled with the direct contact evaporators are a major source of hydrogen sulfide. Under ordinary conditions the black liquor contains some residual sodium sulfide and in passing through the direct contact evaporators this material can be readily displaced by the carbon dioxide and sulfur dioxide in the flue gases. The stabilization of the black liquor by oxidation results in a considerable reduction of the hydrogen sulfide losses, as far as the Cascade evaporator is concerned. On a weight basis the hydrogen sulfide losses from the recovery operations are of a much greater magnitude than the organic sulfur compound losses from the digestion steps.

Review of Testing Methods

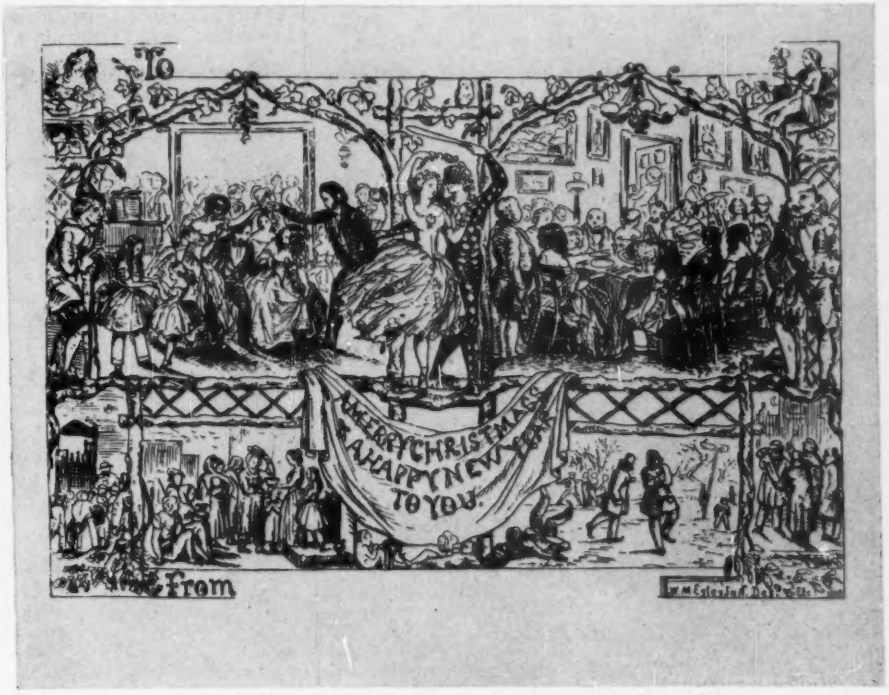
In the various kraft mill gas streams these sulfur compounds are mixed with inert gases which oftentimes make the analysis difficult. Many times the concentrations are extremely low. In the stack gases we have the usual combustion products from the furnace along with some sulfur dioxide and some volatile unburned organic products. In the digester relief and blow gases other volatile organic products are present along with much water vapor. In selecting analytical methods care must be exercised in interpreting results, since some of these extraneous compounds can influence the sulfur compound determination. Several types of analytical procedures are available for characterizing the constituents of Kraft Mill gas streams, notably the precipitation techniques of Bergstrom Trobeck, the silver potentiometric methods of Tamele, the bromine oxidation reaction of Siggia and Edsberg, and the colorimetric determination of hydrogen sulfide by the formation of methylene blue.

However, these procedures are time-consuming and oftentimes the composition of the streams changes very rapidly. This is not only true of digester relief and blow gases, but there are also rapid fluctuations in composition in stack gases. In developing processes for converting or minimizing these foul gas constituents the ultimate goal is frequently the conversion to sulfur dioxide. In evaluating the efficiencies of such a process it is often necessary to distinguish between the oxidized and unoxidized forms of sulfur. A suitable testing procedure would be one that is almost automatic and very rapid and one which would cover a range of concentrations from a fraction of a microgram per liter to concentrations up to several hundred thousand micrograms per liter.

The precision of the method should be close enough for practical purposes to distinguish concentrations within 5% over this very broad concentration range. For practical purposes one can consider the mercaptan and dimethyl sulfide as substitution products of hydrogen sulfide. In all three of these compounds the sulfur is present as sulfide-type sulfur. In most processing steps it is not necessary to distinguish between hydrogen sulfide, alkyl mercaptans, alkyl sulfides and alkyl disulfides. It is much more important that facile and rapid methods are available for the determination of the total amount of sulfur compounds and sulfur dioxide. The difference between the total amount of sulfur compounds and sulfur dioxide will primarily represent the odorous sulfur compounds normally found in Kraft Mill gases.

Catalytic Oxidation Procedure

In the present procedure a measured gas stream containing the sulfide-type sulfur along with oxidized sulfur compounds is passed thru a combustion tube and all of the sulfur compounds are oxidized to sulfur dioxide. The stream is then passed through a controlled amount of standard absorption solution containing hydrogen peroxide at a controlled pH and the sulfur is converted to sulfuric acid. This additional sulfuric acid alters the acidity of the absorption solution and the observed difference in acidity is used as the measure of the total sulfur in the gas stream. A similar determination is made by by-passing the combustion tube and this figure represents the sulfur dioxide in the gas stream. The difference between these two values represents the sulfide-type sulfur in the gas stream. The changes in acidity can be determined in various ways, but for simplicity we have employed a pH meter with very small electrodes to accommodate the small volumes of absorption liquid involved. Care must be exercised in sampling the gas streams since in this procedure the testing can be done on intermittent samples or continuously. A special filter is provided on the sampling tube to remove dust and entrained solids. To prevent condensation the sampling tubes are electrically heated to 100°C. or above the dew point of the associated water vapor. The combustion tube is made of quartz and is about 2½ feet long with a diameter of just under 1 inch. The combustion tube is packed with crushed quartz and is electrically heated to above 1000°C. After



Facsimile of the first-known Christmas Greeting Card. Original now on display in the British Museum in London.

The First Christmas Card

When, in 1842, William Maw Egley, a young London engraver's apprentice, produced the first-known Christmas card, he started what was destined to become both a popular custom and a major industry. While the Christmas card originated in England, the sending and receiving of greeting cards has attained its greatest popularity in America. Today more than two hundred greeting card publishers produce more than three billion cards annually. It is estimated that nearly one hundred million dollars is now spent each year to mail greeting cards of all types and for all occasions—a sum representing approximately ten percent of the Government's first-class mail revenue.

In reaching such a vast volume, greeting cards have become one of the largest users of paper, and thus have made an important contribution to the swift, continuous growth of America's pulp and paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

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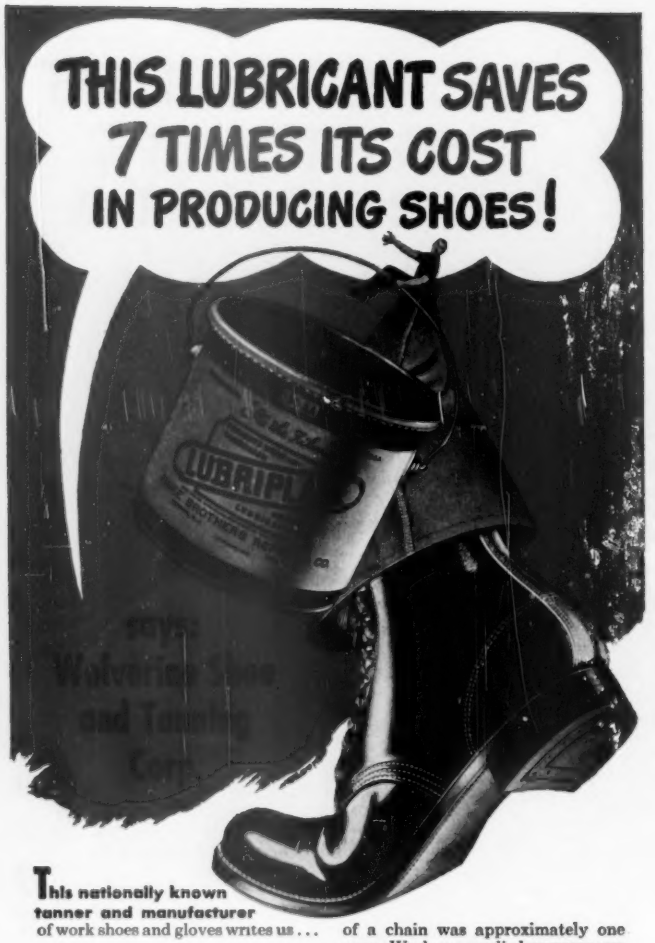

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passing the combustion tube the gases are absorbed in a long, thin glass tube with constrictions through which is passing a controlled amount of standard hydrogen peroxide solution. The hydrogen peroxide contains a small standard amount of sulfuric acid usually at a pH of around 3.5. This prevents the interference of carbon dioxide with the acidity measurements. The amount of sulfur in the gas stream is determined by measuring the changes in pH of the hydrogen peroxide solution. In operation the volume of gas tested and the amount of peroxide solution are adjusted to attain a convenient and accurate measure of changes in acidity. A by-pass is provided around the combustion tube and tests made under these conditions represent the sulfur dioxide in the original gas stream. The difference between the total sulfur by combustion and the sulfur dioxide (without combustion) represents the foul sulfur compounds normally found in Kraft Mill gases.

Tests have been made on known compounds of a concentration range of 2 to 25 micrograms per liter. The materials tested included sulfur dioxide, carbon disulfide, dimethyl sulfide, and hydrogen sulfide. Tests have also been made on mixtures of methyl mercaptan, dimethyl sulfide, carbon disulfide, and dimethyl disulfide. In all cases the recovery and conversion of these compounds to SO_2 was over 90%.

The method has been applied to many types of Kraft Mill gas streams. Typical tests have shown that the air leaving the black liquor oxidation tower contained total sulfur up to 25 micrograms per liter. The flue gases before and after a Bergstrom Tower gave average values of 630 and 660 micrograms of sulfur per liter of gas. The air in the hoods over the counter-current unbleached washers contained up to 25 micrograms of sulfur per liter. The evaporator non-condensible gases are very rich in sulfur compounds and average about 2600 micrograms of sulfur per liter.

The testing by this procedure can be made in a continuous manner and readings can be made as often as convenient or every half minute when both sulfur dioxide and total sulfur are determined. Tests have been made on the furnace gases before and after the Cascades and the results indicate that the composition of the gas streams changes very rapidly depending on combustion conditions. Tests have also been made on digester relief and blow gases both before and after passing through a furnace for burning organic sulfur compounds. The results indicate that it is readily possible to convert all of the organic compounds to sulfur dioxide by burning.

This procedure provides a rapid and convenient means of testing Kraft Mill gases over a concentration range of from less than a part per million to very heavily sulfur laden gas streams.

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1. Over-Center Clutch. The clutch bar runs across the full width of the dashboard. No need here for the operator to hunt for a single lever . . . to take his eyes off the work.

2. Air Steering is *Standard Equipment* You can steer the "OC-18" with just two fingers of one hand.

3. Push Button Electric Starting. The husky starter of the "OC-18" gets the engine going . . . quick.

4. Cold Weather Starting Aid . . . standard equipment on the Oliver "OC-18" for fast, easy starting in extremely low temperatures.

5. Center-Positioned Gear Shift Lever . . . is located right where it's easiest to reach.

6. Ample Leg Room . . . no cramped legs after a hard day's work with the "OC-18".

7. Convenient Foot Parking Brakes are standard equipment on the "OC-18".

8. Comfortable, Two-Man Seat . . . plenty of room for two men in this upholstered seat.

9. Easy-Acting Friction Throttle is located at the right arm rest of the seat in the most convenient position for the operator.

You get plus performance too! A full 126 drawbar horsepower . . . greater stability . . . more track on the ground. Just note the photograph. See how the track hugs the ground almost its entire length. It means real pulling power . . . greater stability and better balance for dozing.

Try out this great new tractor yourself. Ask your Oliver Industrial Distributor to arrange a demonstration. When you've seen the "OC-18", you'll never be satisfied with any other big tractor.

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Lake States APA Woods Meeting

(Continued from page 70)

large areas of timber might establish extensive areas ideal for an insect population of bark beetles, especially in coniferous stands. Some members stated that such an idea was improbable because the presence of sodium arsenite should discourage insects, bark is often forced away from the fiber when the tree is killed, and this process kills the cambium layer on which live timber killing insects live. One treated spruce, however, showed signs of beetle activity, coming from the top of the tree.

A Marathon representative suggested putting chemically-treated pulpwood through the Murrco-Adams-Clark Barker, and thus consistently remove a greater percentage of bark per cord.

Pulpwood Handling Equipment

At the William Bonifas company, north of Champion, there was demonstrated a Dray Loader mounted on a Cletrac Model BD tractor. The loader consists of a small stationary "A" frame boom secured to the back of the tractor, and powered by a fast hoisting winch connected to the tractor power take-off. This tool eliminates manual handling of large and heavy pulpwood sticks. The entire winch is made from a Ford Model "A" rear end and, with a rope attached to the friction clutch, permits positive hoisting control by the operator while on the ground. The operator and one helper are required to set and disengage the two small pup dogs attached to the crotch line of the ⅜ in. hoisting cable. The dray, pulled behind the tractor, is loaded from piles placed parallel to the strip road and unloaded into banks of wood piled along a highland truck trail.

A large number of small pulpwood jobbers have purchased this attachment from Vercillino Bros., at Gwinn, Mich. Built without engineering refinements for $550 this attachment has proven one answer to the problem of attracting labor to perform the manual task involved in skidding pulpwood from cutters' strip.

Vercillino-Ware Loader

Another tractor mounted loader called the Vercillino-Ware Pulpwood Loader was demonstrated. Vercillino Bros. installs a Model HGH Ware Loader with a hydraulically-controlled pulpwood clam attachment on Model A G Cletrac tractor. This pulp clam, with the necessary extension, weighs 600 lbs. and transfers ¼ cord loads of eight-foot pulpwood from pile to dray, from dray to roadside wood piles, and from drays to trucks of any size up to 11 feet in height.

A number of these machines are in use by small jobbers in this area. A single operator can pull the empty dray into strip-road, unhook the tractor and load the dray, skid the load to a highland road and load his truck. For many, this reduction in skidding crew from two to one man has more than offset the $1400 cost of this attachment and has permitted the logging of areas which several years ago were considered submarginal. (This machine was a feature of discussion at the industry's Engineering Conference in Chicago in October.)

R. R. Edgar and a crew of three men demonstrated the new "Loggers Combine" which can skid eight-foot pulpwood a distance of 500 ft., depending on the terrain, and place the wood on a truck. Mounted on an Oliver "88" Industrial wheel-type tractor and equipped with a Heller double-drum winch the boom may be raised or lowered by two hydraulic rams. This permits the rapid loading of logs or pulpwood. Using ⅜ in. cable for the main line and ¼ in. for the haul back line, ½-cord bundles, contained by the passing of Grip-trip choker chains about the center of the pile, are skidded up to the road and loaded onto a truck by an operator, a truck driver, a choker setter and a whistle punk. Guy lines attached to trees or stumps firmly position the 20-foot boom while skidding. Without guy lines 5200 lbs. can be hoisted to a height of 23½ feet. To hoist each bundle high enough for loading, a wide throat block made by the Young Iron Works hangs at the top of the boom and permits the attachment for securing the Grip-trip to pass through the block. By a patented leveling device and a separate boom support frame, no weight or stress is transmitted to the cast iron frame of the tractor.

DISCUSSION SESSION

Lake States Chairman W. H. Hildebrand, of Mead Corp., introduced E. O. Ehrhart, vice-president and woodlands manager of the Armstrong Forest Co., Johnsonburg, Pa., and H. E. Ochner, a regional supervisor of the U. S. Forest Service, to open the discussion session at Escanaba. Panel members for the chemical debarking session also included W. J. Brown, Kimberly-Clark; Russell Watson, private timberland owner, and Mr. Anderson.

Mr. Ehrhart began by telling the group his company plans to treat 40- to 45,000 rough cords of hardwood plywood annually. Because the results of chemical debarking vary with species treated, time of treatment, time harvested, and chemical and girdling method employed, his company does not expect complete bark removal from sticks. Peeling in the woods during sap-peeling season has given way to poisoning of timber and shipment of treated wood which can be barked at the mill in less time and at a lower cost.

Mr. Ehrhart said the reason for discontinuing peeling during peeling season was that the simplicity and uniformity of operation was an advantage. Areas are treated and then logged hot from stump to car or mill instead of first being felled and peeled and later bucked and transported. Costs range from 50-60¢ per cord for labor with an average of $1.00 per cord when all overhead and fixed charges were included.

In discussing the topic of adverse skin effect for men working with sodium arsenite, Mr. Watson mentioned that he demanded a skin test of each crew member before allowing them to work. Mr. Ehrhart expressed the thought ill effects were determined by a man's personal habits. B. I. Buel, of Northern Paper Mills, mentioned use of rubber gloves and mitts, but felt the pressure pack can and brush to be the best solution.

A discussion about elapsed time required before dead poplar will show fair peeling results, revealed that Mr. Watson has treated timber in June and July, found it could be peeled with a knife during August, found it peeled quite well during September, and then peeled very well after the first frost.

Mr. Brown stated that wood treated in July peeled very well in the Kimberly-Clark drum-barkers at the mill in November. H. R. Palmquist of Marathon stated that his mill had experienced better chips and less dirt, all of which was a very strong point in favor of chemically treated wood over sap-peeled wood.

W. J. Brown, of Kimberly-Clark, was called upon by Chairman Hildebrand to discuss a recent meeting in Lansing between his company and the conservation department regarding the finding of poisoned wildlife within a chemically treated timber area. Brown informed the group that 4-500 cords of poplar were treated with sodium arsenite last spring in an area covering three forty acre tracts. Using a solution this year which had been colored by the manufacturer with a red dye, noticeable damage to wildlife this year resulted. Two deer were found with arsenic in the liver tissue. This was determined by several public health laboratories to assure an unbiased report. The theory was advanced by wild-life experts that deer, after a long hard winter, are starved for a certain amount of potassium and that this shortage can be balanced with salt. It is thought that the sodium ion in sodium arsenite also attracts the deer. To be fatal a deer must lick a treated girdle within an hour's time after application. The conservation department has been cooperative in working hand-in-hand with the industry. Don Zettle, of the Michigan conservation dept., informed the group that chemical-treated timber has been fenced in and deer turned loose with no adverse effect. However, the treatment was late in the season and should be renewed next spring for conclusive results.

W. H. Bromley, APA executive secretary, mentioned the New York Chemical Debarking Research Project to which ten companies had contributed $104,000 over a 2-year period. This is an indication of the pulpwood industries' interest in this chemical debarking project. To date it is the feeling of this group that damage to wildlife from chemically-treated timber shows negative results. Mr. Bromley urged that a sample piece of the liver from game suspected of being killed by chemicals be sent to Dr. Webb in care of the New York project, Syracuse University. The group agreed that treatment of timber was done much earlier this spring than ever before and that dead game was found at this early date. Mr. Ehrhart stated that Armstrong had treated 100,000 cords in a heavily populated game area with little noticeable damage. Marathon instructs their crews not to clean brushes in streams, to mix outside of game areas, and to take every precaution possible against spilling.

Members of the group felt industry should be represented at each sportsmen's meeting. By this method, sportsmen can learn of current cooperative efforts between industry and public agencies to assure little damage to wild life.

Murrco-Adams-Clark Barker

H. R. Bruning, of Mead Corp., Clarence Miller of D. J. Murray Mfg. Co., Harold Palmquist of Marathon Corp. and R. D. Salter of Consolidated Water Power and Paper served as a panel for discussion of the Murrco-Adams-Clark barker. The experience of various companies was reported as follows:

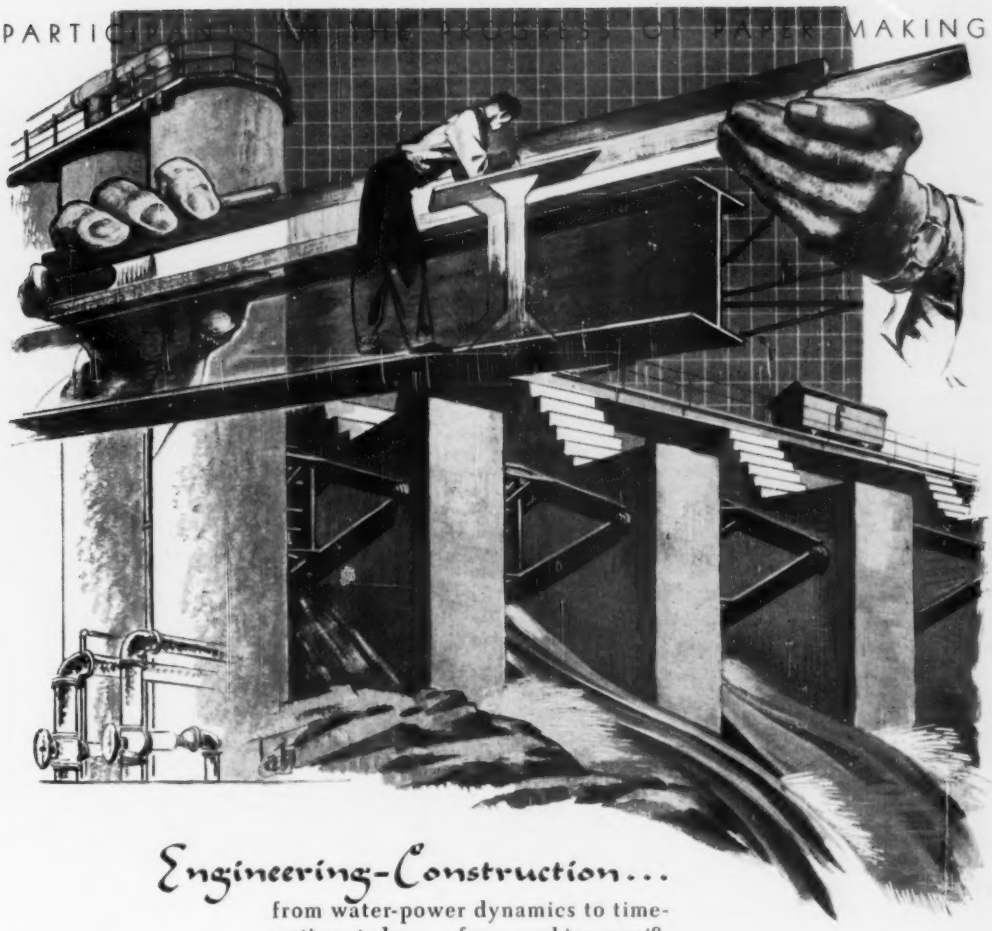
Marathon: This barking unit was first mounted on a tandem drive truck which immediately resulted in numerous mechanical breakdowns and poor barking results. Last spring the barker, with platform and power plant, was mounted on steel runners. Reduction in breakdown time has decreased 75% over that lost last year. The machine is capable of removing bark during any season provided chemically-treated wood is run when signs indicate poor barking qualities.

Consolidated: To go with the barking drum, Consolidated has constructed a sturdy barker attachment which includes the chain and lug infeed conveyor, a hydraulic feed lift to act as a "live deck," the power plant and power transmission equipment, an operator's platform with controls, a bark conveyor, and a discharge pocket. Resting on four runners the entire barking unit may be pulled about the landing by a crawler tractor. Bark is hauled away by trucks.

Operated by a seven man crew, 3300 cords of winter-cut rough poplar were fed into the lift pocket of the barking unit by a ½-yard crawler crane with a clamshell grapple, barked, and loaded directly onto gondola cars by another crane of identical make and size. This resulted in 2800 peeled cords or a shrinkage of

(Continued on page 108)

PARTICIPATES IN THE PROGRESS OF PAPER MAKING



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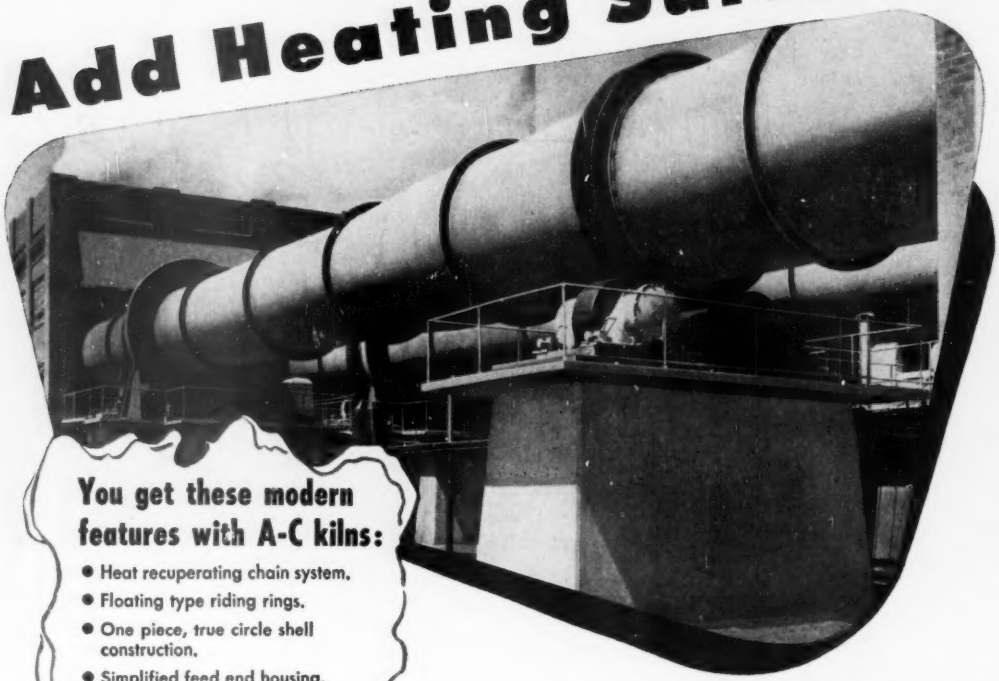

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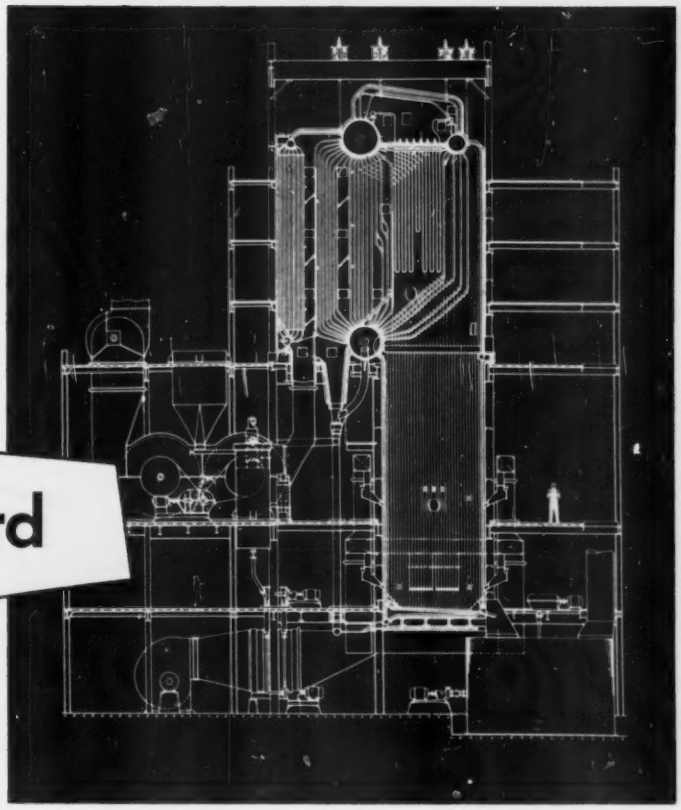
ALLIS-CHALMERS

Now under construction at Bogalusa, La., for the Gaylord Container Corp. is this 350-ton C-E Recovery Unit. Steam is produced at 875 psi and 825 F. It is the fourth C-E Unit at this mill.



Gaylord installs its 4th C-E recovery unit

It was back in 1940, soon after the C-E Recovery Unit had demonstrated beyond the question the merits of its new design features, that the Gaylord Container Corporation of Bogalusa, Louisiana, purchased its first C-E Unit. That was a 175-ton unit.

In 1946, as part of a modernization and expansion program, another C-E Unit of 200-ton capacity was ordered. And again in 1947 another – a duplicate – was purchased.

Work is now under way for the installation of a fourth – and still larger – unit, a cross-sectional elevation of which is shown above.

The order and re-order aspect of this situation is not unusual. Two other large companies have purchased C-E Recovery units on four occasions; two companies have ordered three times and eight companies have ordered twice.

These are the facts. They lead to but one conclusion.

B-628

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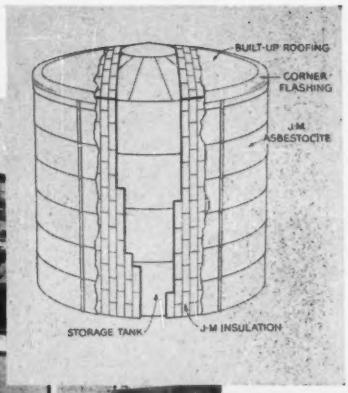
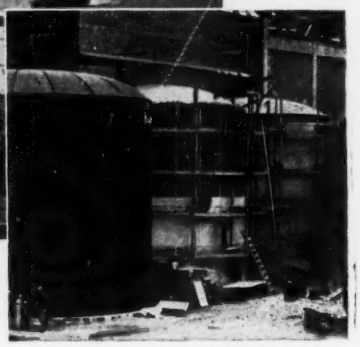
Cutaway drawing shows how J-M *Weather-Protected* Insulation ▶ is applied to tanks such as those at the S. D. Warren Company paper mill. Standard methods for mechanical securement of the insulation are used. Asbestocite sheets are then applied over the insulation, in accordance with the simplified Johns-Manville specification.





▲ **(Above)** Completed job of J-M *Weather-Protected* Insulation on black liquor tanks of the S. D. Warren Company.

(Right) Skilled applicators of an outstanding J-M Insulation ▶ Contractor, P. S. Thorsen Co. of South Boston, Mass., applying Asbestocite sheets over Zerolite insulation.

S. D. Warren Company saves fuel, reduces maintenance on outdoor tanks with J-M *Weather-Protected* Insulation

On black liquor tanks of the S. D. Warren Company paper mill at Cumberland Mills, Maine, Johns-Manville *Weather-Protected* Insulation pays a "double dividend":

It saves money on fuel and maintenance. J-M Zerolite* insulation in 1½" thick sheets keeps the heat in . . . thereby saving a substantial amount in fuel costs. J-M Asbestocite*, a strong asbestos-cement sheet material, covers the Zerolite to protect it both from the weather and from wetting due to normal plant operations. This "bodyguard" layer of Asbestocite makes the tanks virtually maintenance-free and helps hold down operating costs.

It helps provide close temperature control. The temperature of black liquor in these tanks must be maintained so that it will flow freely and not clog up pumping apparatus. J-M Weather-Protected Insulation helps do the job dependably and economically.

Whatever the operating temperature of outdoor tanks and vessels, Johns-Manville offers the right insulation for application under the Asbestocite weather protection. For example, J-M 85% Magnesia Insulation is also widely used for this service because of its proved performance for temperatures to 600 F.

To be sure that the insulation and its weather protection is properly applied to pay the greatest return on your investment, J-M offers the services of experienced J-M Insulation Engineers and J-M Insulation Contractors. These men stand ready to give you an insulation job that will more than pay off your initial investment through maximum fuel savings.

For further information about J-M Weather-Protected Insulation, write to Johns-Manville, Box 60, New York 16, New York. In Canada, 199 Bay Street, Toronto 1, Ontario. *Reg. U. S. Pat. Off.

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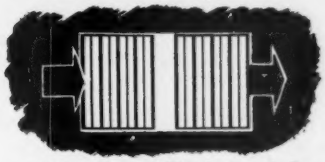
These 10 BIG Features Make Western Precipitation COTTRELLS Outstanding in the Paper Industry

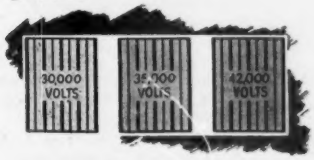
When considering COTTRELL Equipment for salt cake recovery, or any other application in the paper industry, remember this . . . *Western Precipitation Corporation not only pioneered the first commercial application of* COTTRELL *equipment made in any industry,* but *also pioneered the first application of* COTTRELL *equipment in the paper industry.*

Among the vitally important advantages found in Western Precipitation COTTRELLS, the following are particularly important in paper mill installations ...

1 **Sustained Year-After-Year Efficiency:** The recovery efficiency of Western Precipitation COTTRELLS does not fall off in service. All parts are of ample design to maintain guaranteed over-all efficiency year-after-year —not for just a single acceptance run.



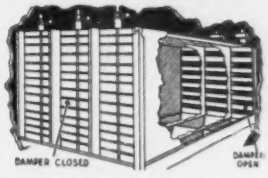
2 **Higher Recovery:** The horizontal flow design of Western Precipitation COTTRELLS eliminates collected material falling countercurrent to incoming gas stream. This assures higher recovery, minimum resuspension of recovered material in gas stream.



3 **Maximum Performance:** Horizontal flow of Western Precipitation COTTRELLS permits use of multiple electrical sections so that voltage in each section can be varied to dust loading for maximum recovery without arc-over or electrical breakdowns.

4 **Lower Over-all Cost:** When comparing COTTRELL costs, be sure to compare total *installed* cost, including duct work.

5 **Simpler Maintenance:** Because all interior parts and electrode systems are readily accessible, Western Precipitation COTTRELLS are far easier to maintain and service. Saves "down" time, saves repair costs.



6 **Greater Adaptability:** Horizontal flow design permits use of multi-vane dampers in multiple-unit installations. Thus, one unit can be shut off completely to permit maintenance operations without closing down entire Precipitator. Also, the dampers can be used in slightly-closed position to assure more uniform gas distribution.
On single-unit installations, chain curtains assure uniform distribution of gases. Curtains are easily kept clean by shaker mechanisms provided.

7 **"V"-Shaped Hoppers:** Horizontal design permits use of continuous "V"-shaped hoppers for collecting recovered material. Steeply-sloped walls in this type of hopper prevent build-up or bridging of recovered material.

8 **Space-Saving Compactness:** Not only do their horizontal design permit maximum compactness in Western Precipitation COTTRELLS, but various sections of a unit can be arranged for indoor installation in space above cascade evaporators, thus utilizing space otherwise wasted.

9 **All-Weather Construction:** Western Precipitation COTTRELLS are built for both indoor or outdoor installation, and this organization has had extensive experience with special construction to prevent excessive corrosion in rigorous northern climates.

10 **More Extensive Experience:** Since pioneering the commercial application of COTTRELL Precipitators over 42 years ago, Western Precipitation has consistently led in developing one unique advancement after another. Such features as 4-Point Electrode Suspension that eliminates misalignment of electrodes and reduction in recovery efficiencies . . . Unusually Rugged Rapper Design that assures proper cleaning of electrodes . . Extensive Experience with all types of electrode designs . . and many other advantages assure you the ultimate in COTTRELL design and efficiency when you bring your recovery problems to Western Precipitation engineers.

Without obligation our nearest representative will gladly make Western Precipitation COTTRELL *experience available to you for solving your particular recovery problem. Why not contact him today?*

IMPORTANT! In addition to COTTRELL *Electrical* Recovery equipment, Western Precipitation Corporation also designs and installs the well-known MULTICLONE *Mechanical* Collectors for hogged-fuel fired boilers. These units are unusually compact, highly efficient and can be readily fitted into existing plants at minimum installation costs. *Write for details!*

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CORROSION RESISTANT ALLOYS

By James T. Gow

Chief Metallurgist, Electric Steel Foundry Co., Portland, Ore.

(A preceding article "What is Corrosion?," by Mr. Gow, was published in our June 1952 issue, p. 78)

A variety of compositions of cast high alloys is available for use with the corrosive solutions to be encountered in pulp and paper mills and other corrosive services.

The commercially available alloys for such services may be grouped into three types of composition: 1. Iron-chromium (hardenable and ferritic stainless irons). 2. Iron-chromium-nickel (austenitic stainless steels). 3. Nickel base alloys (nickel, nickel-copper, nickel-chromium, nickel-molybdenum and nickel-molybdenum-chromium).

The range of alloy compositions having adequate corrosion resistance is of course, greater as the corrosive conditions moderate. Conversely, suitable alloys become fewer as the service requirements become more exacting or the corrosive conditions more severe.

The selection of an alloy to give satisfactory service in a corrosive condition requires careful attention be given to such factors concerned with the corrosion environment as its oxidizing characteristics, aeration, acidity, velocity, abrasiveness, temperature, pressure and stress. Since the corrosion resistance of the various alloys is largely dependent on the nature of the corrosive conditions, the following general statements on the fields of usefulness of certain of the most popular alloy compositions are intended to be used only as a preliminary guide to the type or types of alloy compositions which may be suitable.

Iron-Chromium Alloys

The range of chromium content in iron-chromium alloys of main importance for corrosion resistant applications is from about 12% to 28% Cr. The alloys containing chromium in amounts up to about 18% are hardenable by heat treatment in much the same manner as the plain carbon and low alloy engineering steels. Iron-chromium alloys with greater amounts of chromium than about 18% cannot be hardened appreciably by heat treatment as they have a ferritic structure at all temperatures.

These alloys are highly resistant to strongly oxidizing solutions and find considerable application in chemical plants processing nitric acid and nitrates. De-aerated or reducing conditions are unfavorable for the stainless irons. The ease with which the Cr-Fe alloys become passive in oxidizing media in general increases with increasing chromium content.

The Corrosion Resistant Casting Grades
12% Cr-Fe (ESCO Alloy 32)

Approximate Composition

Carbon	.25% Max.
Chromium	11.50-14.00%
Nickel	.50% Max.
Molybdenum	.50% Max.

This alloy is used extensively for applications requiring resistance to erosion and for oxidizing type applications.

20% Cr-Fe

Approximate Composition

Carbon	.25% Max.
Chromium	18.00-22.00%
Nickel	2.00% Max.

This alloy is in general more corrosion resistant than the 12% Cr-Fe alloy. It is used extensively in contact with nitric acid.

Iron-Chromium-Nickel Alloys

The iron-chromium-nickel alloys of main importance for corrosion resistant applications are generally referred to as austenitic stainless steels. They embrace the composition range from about 16% to 25% Cr and 8 to 30% Ni. These austenitic alloys cannot be hardened except by cold deformation. They are used more extensively in the chemical industries because of their excellent resistance to corrosion in a wide range of chemicals in combination with strength, toughness, machinability and ease of welding.

The iron-chromium-nickel alloys find their main application in acid solutions which are strongly oxidizing in character. The stainless steels are also rendered passive in solutions of dilute acids with high acidity and relatively weak oxidizing power when containing strongly oxidizing salts such as ferric and cupric sulphates. An increase in temperature if accompanied by a lowering of the oxidizing capacity of the acid solution will increase the corrosion rate of the stainless steel in the acid.

These steels have excellent resistance to nitric acid which is a strong oxidizing agent under most conditions of temperature and concentration.

Sulphuric and sulphurous acid solutions may or may not be corrosive to stainless steel depending on the concentration, temperature, and oxidizing power of the solution. Molybdenum and/or copper additions to the stainless steels greatly improve their resistance to such solutions.

The austenitic stainless steels are passive in most all concentrations of acetic acid at temperatures up to boiling. However, hot acetic acid vapors are highly corrosive. Molybdenum improves the corrosion resistance to hot acetic acid.

Weak and concentrated alkaline solutions are generally handled successfully by the austenitic stainless steels. Ordinarily, salt solutions other than those containing acid chloride, do not corrode stainless steel. Corrosion is generally to be expected when the steel is contacted by oxidizing acid chloride salts, fluorides, and bromides. The stainless steels resist corrosion in sea water if oxygen is available to the metal surface. Corrosion of stainless steel in contact with food products is usually negligible. Satisfactory resistance is generally provided in fresh water, boiler waters, high pressure steam, and mine waters.

The nonaqueous products of the oil industry and many other commercially important nonaqueous corrosive liquids and gaseous corrodents are successfully resisted by the stainless steels. Moist chlorine and hydrochloric acid gases seriously attack stainless steel, while if dry they generally are not injurious. Sulphur dioxide and hydrogen sulphide are corrosive if moist and the higher alloyed stainless steels are the most resistant. Hot ammonia gas, carbon bisulphide and fluorine are corrosive to stainless steel.

The Corrosion Resistant Casting Grades
18-8 (ESCO Alloy 40)

Approximate Composition

Carbon	.12% Max.
Chromium	18.00-21.00%
Nickel	8.00-11.00%

This is the general utility austenitic type stainless steel. This steel is outstanding in its resistance to nitric acid and nitrates. It has useful resistance to the corrosive effects of many different chemicals in the chemical, textile, paper, dairy and food handling industries.

18-8 Mo (ESCO Alloy 45)

Approximate Composition

Carbon	.12% Max.
Chromium	18.00-21.00%
Nickel	9.00-12.00%
Molybdenum	2.00- 3.00%

The 18-8 type stainless steel with about 3% molybdenum is the most prominent corrosion resistant casting alloy. This alloy gives satisfactory service in many applications where the plain 18-8 alloy does not have adequate corrosion resistance. In general, it is more resistant than 18-8 to the same types of corrodents.

The molybdenum addition to the 18-8 type alloy tends to decrease the susceptibility to stress corrosion and improve the resistance to pitting corrosion. The action of the molybdenum is that of fortifying the passive film under conditions in which it otherwise would be likely to fail.

The presence of molybdenum is especially beneficial in improving resistance to organic acids, acetic acid, halogen salts, sea water, alkaline liquors, hot dilute or cold concentrated sulphuric acid, phosphoric acid, sulphite liquors, mine water, fatty acids, and foodstuffs.

The 18-8 Mo alloy is used extensively in paper pulp manufacture, chemical, textile and dye industries.

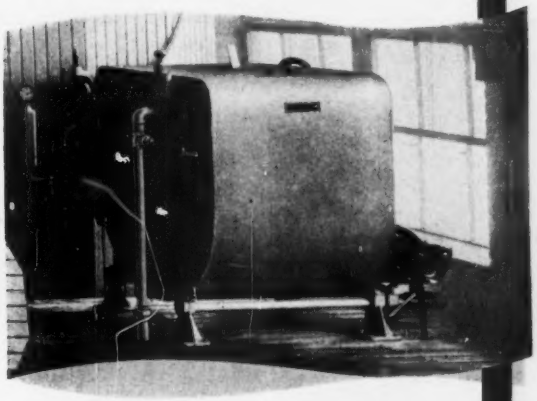
The structure of the castings made to the above nominal composition will have some delta ferrite areas present within

here's how to

maintain chemical feeding accuracy to 1½%

Your plant operations will benefit when you have assurance like this! With Infilco equipment, random samples show no variation in chemical content exceeding 1½%.

Because of the unique vertical agitation principle of operation, liquid circulates with an *up and down* motion in the mixer . . . thus avoiding stratification. There are no corners or "dead spaces" in the half-round tank where solids can collect . . . there's no need for daily or weekly clean-outs.



Infilco Chemical Mixers and Feeders combine in one continuous automatic process, the preparation of a uniform chemical solution or suspension and volumetric feeding of the prepared material.

CHECK THESE ADVANTAGES—

You can depend on uniform mixing and accurate feeding of soluble or insoluble materials with water, oil and other liquids with the Infilco Chemical Mixer and Feeder and related equipment. Here's the automatic unit designed particularly for water conditioning, sewage treatment and process liquid conditioning . . . and here are valuable operating advantages offered only by Infilco—

1. Plow-shaped agitators keep the liquid circulating up and down to avoid any degree of stratification.

2. Half-round tank, with rotating element, eliminates corners and dead spaces. No "Sump" required.

3. Equipped for constant or variable rate feeding.

4. Collector cups pass downward through chemicals with orifices up. This design effects "blow-out." Keeps orifices clean.

5. Two or more chemicals may be prepared and fed together. Discharges may be divided with regulated feed rates to two different points.

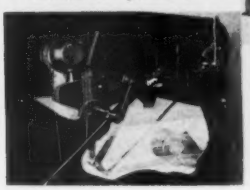
6. Constant "head" over orifices during entire period of discharge.

7. Changes in drive speed do not affect regularity of feed.

8. Designed for the full range of process industry capacities.

Check these advantages for your operation by sending for the Bulletin described below.

Below
Chemical measuring cup discharging through orifice into the collector funnel. The cut-off shield above the collector funnel can be positioned by the manual variator to change chemical feed quantities.



Above
Infilco Mixer and Feeder with section tank cutaway to show unique plow-shaped agitators, chemical measuring cups and collector funnel.

Write for case histories and illustrated bulletin

INFILCO since 1894

INFILCO INC.
Tucson, Arizona
Plants in Chicago & Joliet, Illinois
FIELD ENGINEERING OFFICES IN 26 PRINCIPAL CITIES

INFILCO INC.
Box 5033, Tucson, Arizona

We are interested in mixing and feeding

_____
(name chemicals)

in one continuous and automatic process for

_____
(name process liquid)

Please send us your Chemical Mixer-Feeder Bulletin 350D. No obligation, of course.

Name_____ **Title**_____
Company_____
P. O. Address_____
City_____ **Zone**_____ **State**_____

the austenitic matrix. The castings will therefore be slightly ferro-magnetic. Since the castings are generally not subjected to temperatures above about 550° F. in service the delta ferrite is considered desirable as it decreases the susceptibility to intergranular corrosion. For service temperatures above 550° F. the above nominal composition is not recommended because such temperatures cause the ferrite to transform to the brittle sigma phase. For elevated temperature service an alloy of this same general type composition will be supplied which will have the composition so balanced that it will have a wholly austenitic structure, and there will be no tendency for embrittlement through formation of sigma phase.

ALLOY CASTING INSTITUTE STANDARD DESIGNATIONS AND CHEMICAL COMPOSITION RANGES FOR HEAT AND CORROSION RESISTANT CASTINGS

ESCO ALLOY NO.	ACI CAST DESIGNATION	WROUGHT ALLOY TYPE (See Note A)	Composition — per cent (See Note C)							
			C	Mn max.	Si max.	P max.	S max.	Cr	Ni	Other Elements
32C	CA-15	410	0.15 max.	1.00	1.50	0.04	0.04	11.5-14	1 max.	Mo 0.5 max.†
32	CA-40	420	0.20-0.40	1.00	1.50	0.04	0.04	11.5-14	1 max.	Mo 0.5 max.†
34	CB-30	431	0.30 max.	1.00	1.00	0.04	0.04	18-22	2 max.	.....
35	CC-50	446	0.50 max.	1.00	1.00	0.04	0.04	26-30	4 max.	.....
51	CE-30	...	0.30 max.	1.50	2.00	0.04	0.04	26-30	8-11	.....
40L	CF-8	304	0.08 max.	1.50	2.00	0.04	0.04	18-21	8-11	.....
40	CF-20	302	0.20 max.	1.50	2.00	0.04	0.04	18-21	8-11	.....
45L 45T	CF-8M	316	0.08 max.	1.50	1.50	0.04	0.04	18-21	9-12	Mo 2.0-3.0
45	CF-12M	316	0.12 max.	1.50	1.50	0.04	0.04	18-21	9-12	Mo 2.0-3.0
41 41W	CF-8C	347	0.08 max.	1.50	2.00	0.04	0.04	18-21	9-12	Cb 8xC min., 1.0 max., or CB-Ta 10xC min., 1.35 max.
40F	CF-16F	303	0.16 max.	1.50	2.00	0.17	0.04	18-21	9-12	Mo 1.5 max.. Se 0.20-0.35
	CF-16Fa	303	0.16 max.	1.50	2.00	0.04	0.20-0.40	18-21	9-12	Mo 0.40-0.80
43C	CH-20	309	0.20 max.	1.50	2.00	0.04	0.04	22-26	12-15	.....
53C	CK-20	310	0.20 max.	1.50	2.00	0.04	0.04	23-27	19-22	.....
20-50	CN-7MCu	...	0.07 max.	1.50	*	0.04	0.04	18-22	21-31	Mo- Cu*
35	HC	446	0.50 max.	1.00	2.00	0.04	0.04	26-30	4 max.	Mo 0.5 max.†
35T	HD	327	0.50 max.	1.50	2.00	0.04	0.04	26-30	4-7	Mo 0.5 max.†
51	HE	...	0.20-0.50	2.00	2.00	0.04	0.04	26-30	8-11	Mo 0.5 max.†
40H	HF	302B	0.20-0.40	2.00	2.00	0.04	0.04	18-23	8-12	Mo 0.5 max.†
43H	HH	309	0.20-0.50	2.00	2.00	0.04	0.04	24-28	11-14	Mo 0.5 max.† N 0.2 max.
	HI	...	0.20-0.50	2.00	2.00	0.04	0.04	26-30	14-18	Mo 0.5 max.†
53H	HK	310	0.20-0.60	2.00	3.00	0.04	0.04	24-28	18-22	Mo 0.5 max.†
	HL	...	0.20-0.60	2.00	3.00	0.04	0.04	28-32	18-22	Mo 0.5 max.†
52H	HT	330	0.35-0.75	2.00	2.50	0.04	0.04	13-17	33-37	Mo 0.5 max.†
55	HU	...	0.35-0.75	2.00	2.50	0.04	0.04	17-21	37-41	Mo 0.5 max.†
56	HW	...	0.35-0.75	2.00	2.50	0.04	0.04	10-14	58-62	Mo 0.5 max.†
57	HX	...	0.35-0.75	2.00	2.50	0.04	0.04	15-19	64-68	Mo 0.5 max.†

†Molybdenum not intentionally added.
*There are several proprietary alloy compositions falling within the stated chromium and nickel ranges, and containing varying amounts of silicon, molybdenum and copper. Such alloys are available from licensed producers only.

Designations with the initial letter "C" indicate alloys generally used to resist corrosive attack at temperatures less than 1200° F. Designations with the initial letter "H" indicate alloys generally used under conditions where the metal temperature is in excess of 1200° F. The second letter represents the nominal chromium-nickel type; the nickel content increasing in amount from "A" to "X". For example, "F" stands for the 19%Cr-9%Ni, "K" for the 25%Cr-20%Ni. and "W" for the 12%Cr-60%Ni alloy types. Numerals following the letters indicate the *maximum* carbon content of the corrosion resistant alloys; carbon content may also be designated in the heat resistant grades by following the letters with a numeral to indicate the *midpoint* of a ±0.10% carbon range. If special elements are included in the composition they are indicated by the addition of a letter to the symbol. Thus, "CF-8M" is an alloy for corrosion resistant service, of the molybdenum-containing 19%Cr-9%Ni type with a maximum carbon content of 0.08%.

NOTE A—Wrought alloy type numbers are listed only for the convenience of those who want to determine corresponding wrought and cast grades. Because the cast alloy chemical composition ranges *are not the same* as the wrought composition ranges, buyers should use cast alloy designations for proper identification of castings.

NOTE B—Most of the standard grades listed are covered by American Society for Testing Materials specifications A 296-49T and A 297-49T.

NOTE C—*ESCO* will produce these alloys to narrower composition ranges and will make modifications of these analyses to meet special requirements upon request.

NOTE D—*ESCO* corrosion resistant Alloys 40 and 45 are also produced as EXTRA LOW CARBON grades, with .04 maximum carbon content.

DE LAVAL
LIQUOR PUMPS

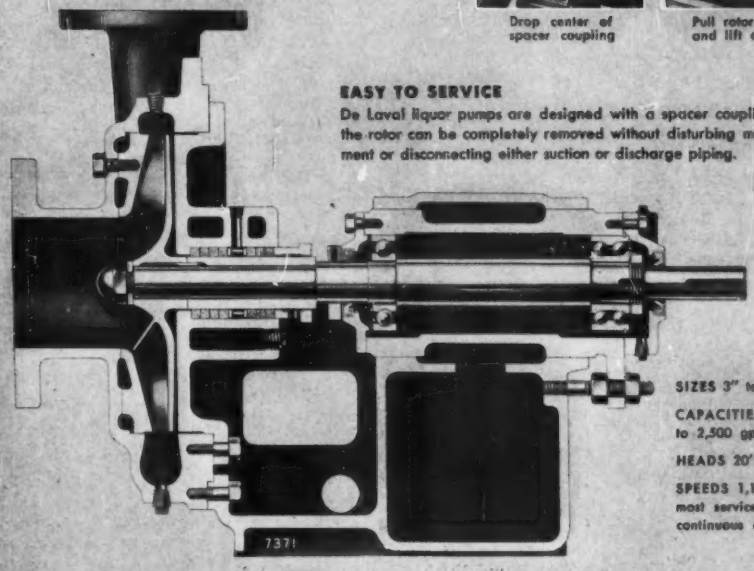
for tough recovery mill service

Drop center of spacer coupling

Pull rotor back and lift out

EASY TO SERVICE

De Laval liquor pumps are designed with a spacer coupling so that the rotor can be completely removed without disturbing motor alignment or disconnecting either suction or discharge piping.



SIZES 3" to 6"

CAPACITIES 100 gpm to 2,500 gpm

HEADS 20' to 150'

SPEEDS 1,150 rpm for most services requiring continuous operation

- One piece suction nozzle with single joint minimizes leakage.
- Eductor vanes on back of impeller relieve stuffing box pressure.
- Rotor can be adjusted with external adjusting screw to compensate for wear.
- Oil mist lubrication minimizes bearing friction.
- Extra deep stuffing box has inlet and outlet water seal connections and inlet and outlet stuffing box cooling connections.
- Suction liner is easily and inexpensively renewed.
- Heavy stiff shaft withstands severe operating conditions.

The important design features, shown above, explain why De Laval type CL Liquor Pumps (1) take the punishment of tough recovery mill service for years; (2) cut maintenance costs.

These pumps are especially designed to handle "tough" *corrosive* or *erosive* liquids such as hot or cold acids, alkalies, digester liquors, milk of lime, etc. What's more, De Laval Liquor Pumps are easy to get at for servicing, thus substantially reduce downtime.

Write for Bulletin 1100 giving full application and specification data on De Laval pumps for the paper industry.

DE LAVAL *Liquor Pumps*

DE LAVAL STEAM TURBINE COMPANY

813 Nottingham Way, Trenton 2, New Jersey

DL148

18-8 Cb (ESCO Alloy 41)

Approximate Composition

Carbon	.08% Max.
Chromium	18.00-21.00%
Nickel	9.00-12.00%
Columbium	10 x C% Min.

This stainless steel is stabilized for service at elevated temperatures.

The columbium addition to this alloy prevents a detrimental grain boundary precipitation of chromium carbides in service at temperatures in the carbide precipitation range of about 650° F. to 5100° F., or during welding fabrication.

The resistance of this columbium bearing steel to corrosion is generally approximately equal or slightly less than that of the 18-8 steel in the same types of corrodents.

Alloy 20 (Durlron patent)

Approximate Composition

Carbon	.08% Max.
Chromium	19.00-22.00%
Nickel	27.50-31.00%
Molybdenum	2.00- 2.5%
Copper	3.00- 3.50%

This alloy has greater resistance to sulfuric acid solutions than the 18-8 Mo stainless. The copper content of this alloy is of fundamental importance.

Alloy 20 has good resistance to oxidizing acids. It is used extensively in the manufacture of high octane gasoline, solvents, explosives, plastics, heavy chemicals, organic chemicals and pharmaceuticals.

Nickel Base Alloys

The nickel base alloys as a general rule resist corrosion by reducing acids while oxidizing conditions most often accelerate their corrosion. A variety of compositions are commercially important which have nickel as the main element and with other elements such as copper, chromium and molybdenum added to fortify resistance to attack in certain environments.

The nickel base alloys have a high degree of resistance to corrosion by natural waters, distilled water and waters containing hydrogen sulphide and free carbon dioxide. Nickel and nickel-copper alloys, however, are corroded by acid mine waters containing appreciable amounts of ferric or cupric salts. Nickel and nickel-copper alloys are resistant to attack in sea water when the water is in motion, but pitting occurs under stagnant exposure. The nickel-copper alloy is most serviceable in sea water where resistance to impingement and cavitation corrosion is important.

The nickel base alloys have useful resistance to corrosion by sulphuric, phosphoric, and hydrofluoric acid within certain limits of composition and temperature.

A Ni-Si-Cu alloy has high resistance to corrosion in concentrated solutions of sulphuric acid at elevated temperatures.

The practical application of nickel and nickel-copper alloys in handling hydrochloric acid at atmospheric temperatures is generally limited to relatively air free acid at concentrations of less than 20% by weight. Nickel-molybdenum-iron alloys are resistant to hydrochloric acid in all concentrations at room temperature, The resistance, however, drops off as the temperature is increased.

The nickel base alloys show excellent resistance to corrosion by organic acids under the most frequently encountered conditions. The nickel-molybdenum alloys show best resistance to acetic and formic acid. Nickel and nickel-copper alloys are usefully resistant to stearic and oleic acid. Nickel-chromium alloys have excellent corrosion resistance to the fatty acids at the distillation temperatures of 400° to 600° F.

The nickel base alloys are commonly used in contact with the dilute organic compounds of food products such as fruit and vegetable juices, dairy products and alcoholic beverages.

Oxidizing acids such as nitric and nitrous, or other acids containing oxidizing chemicals such as ferric and cupric salts, peroxides, chromates and the like generally severely corrode nickel, nickel-copper and nickel-molybdenum alloys. Nickel-chromium alloys, however, are resistant to strongly oxidizing acids at atmospheric temperature, but are generally inferior to the Fe-Cr and Fe-Cr-Ni stainless steels in hot oxidizing acids. The Ni-Mo-Cr alloy is resistant to all concentrations of nitric acid at room temperature, and to dilute nitric at temperatures up to about 150° F. Also this alloy is resistant to other oxidizing acids or mixed acids such as sulphuric and nitric, chromic, copper sulphate, dichromates or permanganates and similar combinations.

Alkalies and neutral or alkaline salt solutions have very little corrosive effect on the nickel base alloys. Nickel satisfactorily resists corrosion by boiling solutions of the strongest alkalies. Ni-Cr alloys are resistant to acid salt solutions except when such oxidizing halogen salts as ferric, cupric or mercury salts are present in appreciable amounts. The Ni-Mo and Ni-Mo-Cr alloys are resistant to acid chlorides and acid phosphates. The nickel, Ni-Mo, Ni-Mo-Cr and Ni-Cr alloys resist all concentrations of ammonium hydroxide while Ni and Ni-Cu alloys are corroded appreciably in all but very dilute solutions.

The Corrosion Resistant Casting Grades

Cast Nickel

Approximate Composition

Carbon	.25% Max.
Nickel	97.00% Min.
Copper	.50% Max.

Nickel has excellent resistance to caustic alkaline solutions such as sodium and potassium hydroxides and sodium carbonate and bicarbonate.

It is also widely used when it is necessary to avoid contamination of a product with such metals as copper and iron.

Reducing conditions generally retard corrosion of nickel while oxidizing conditions most often accelerate its corrosion.

Cast Monel

Approximate Composition

Carbon	.30% Max.
Nickel	62.00-68.00%
Aluminum	.50%
Copper	23.00% Min.

Among the corrosion conditions to which Monel is normally resistant are non-oxidizing acids, caustic, neutral reacting solutions, waters and brines, food products and miscellaneous organic substances. This alloy is in general more resistant to reducing conditions than nickel.

Those corrosive conditions in which Monel would generally be corroded to too great an extent to be practical, include oxidizing acid solutions, strong ammonium hydroxide and strongly oxidizing alkaline substances.

Cast Inconel

Approximate Composition

Carbon	.25% Max.
Chromium	12.50-14.00%
Nickel	76.50-78.50%

The chromium content of Inconel makes it superior to nickel under oxidizing conditions in general, while considerable resistance to reducing conditions and strong alkaline solutions is retained. It is used widely in the food, dairy and soap manufacturing industries.

Alloy A

Approximate Composition

Carbon	.10% Max.
Nickel	55.50-59.50%
Molybdenum	18.00-22.00%

The most unique property of this alloy is its resistance to hydrochloric acid of all concentrations at room temperature and to unaerated solutions at temperatures up to about 160° F. This alloy is generally satisfactory for fixtures and parts for continuous or repeated submersion in cyanide baths, including use where the heating is followed by quenching in water or in acid pickling baths.

Alloy B

Approximate Composition

Carbon	.10% Max.
Nickel	62.50-66.50%
Molybdenum	28.00-32.00%

This alloy is unusually resistant to all concentrations of hydrochloric acid at temperatures up to the boiling point.

The presence of oxidizing salts such as ferric and cupric chloride in acid solutions are likely to increase considerably the corrosion of Alloys A and B. This alloy is the most resistant of the nickel base alloys to boiling sulphuric acid at concentrations lower than 60%.

Alloy C

Approximate Composition

Carbon	
Chromium	13.00-17.00
Nickel	54.50-58.00
Molybdenum	15.00-19.00
Tungsten	3.50- 7.50

Alloy C has useful resistance to hypochlorites and other solutions containing free chlorine in appreciable concentrations at temperatures below about 100° F. Moist chlorine gas is effectively resisted by this alloy.

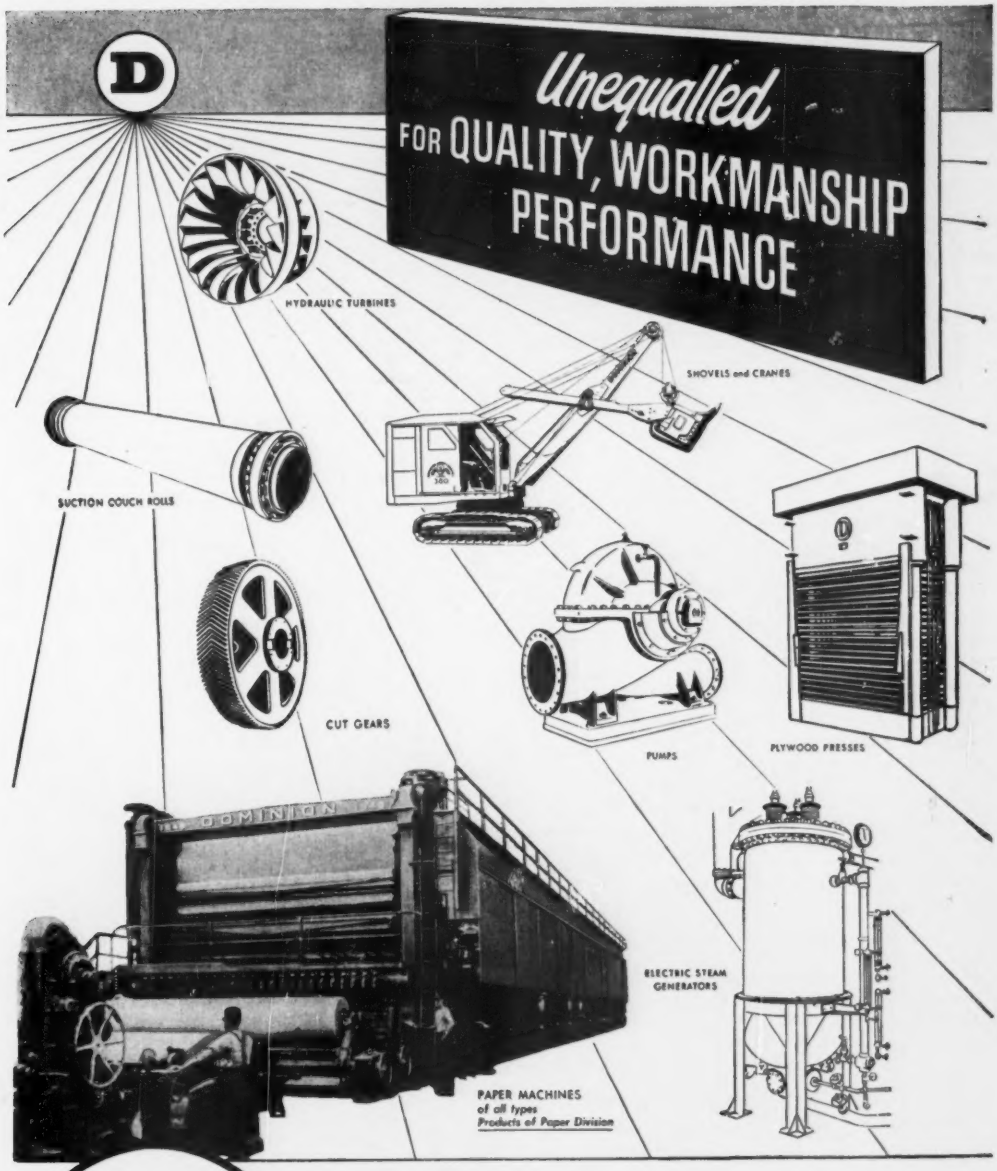
It is resistant to oxidation at temperatures up to 2100° F. and is useful as racks and trays for heat treating operations at 2000° F. and as carburizing equipment.

Alloy D

Approximate Composition

Carbon	.10% Max.
Silicon	8.0-11.0%
Nickel	85.90%
Copper	3.00%
Aluminum	2.00%

This alloy possesses useful resistance to



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86" Model E. Undercut Trimmer showing side loading table. Loading table and air for floating pile are optional equipment.
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UNDERCUT TRIMMER
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The S & W Model E Undercut Trimmer meets the needs of the modern finishing department for high production, accuracy and safe operation. For years the Standard Undercut Trimmer and the Model E have been giving outstanding service in the leading plants of the country.

Now, we offer the Model E with side loading table and air for floating pile, for fast, straight line operation, ease of handling stock and increased efficiency. The Model E is built in 56", 66", 76" and 86" widths.

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The **SMITH & WINCHESTER** *Manufacturing Company*
SOUTH WINDHAM, CONN.

corrosion by all concentrations of sulphuric acid at temperatures as high as the boiling point.

Alloy D. is fairly resistant to hydrochloric acid up to a maximum temperature of about 100° F.

Alloy D is the most resistant of the nickel base alloys to boiling sulphuric acids at concentrations greater than 60%.

Bigger Plane for Marathon

Marathon Corp., Menasha, Wis., is getting a 10-passenger Lockheed Lodestar airplane to replace its present 5 passenger Beachcraft. The new plane is similar to the Air Force C-60; cruising speed, 225 mph., wingspan, 65 ft. Its pilot is Bill Brennard, nationally known racing pilot.

Equipment as Chosen For Red Rock Mill

Progress is being made at Red Rock, Ont., where the mill of Brompton Pulp & Paper Co., subsidiary of St. Lawrence Corp., is being enlarged at a cost of some $22,000,000.

Installations include: A 240 inch wire width 600 ton Kraft board machine by John Inglis; primary headbox by Valley Iron Works, which will also supply a secondary headbox. Five vacuum pumps are by Nash Engineering. The dryer hood system is by Ross Engineering of Canada.

Two 125,000 lb.-per-hour steam generating units are being supplied by Babcock-Wilcox & Goldie-McCulloch: Two digesters by John Inglis; four hot stock refiners by Sprout, Waldron & Co.; two brown stock vacuum washers and a Swenson septuple evaporator by Whiting Corp. (Canada).

Kimberly Mill Story

The 63-year old Kimberly, Wis., mill of Kimberly-Clark Corp. was written up in the company's magazine *Cooperation* recently. Most recent completed project at the mill, it said, was the rebuilding of the No. 2 paper machine. Earlier, in 1945-46, Nos. 1, 2 and 3 machines were remodeled to fully process all-coated paper on both sides, the process which had been introduced on No. 4 in 1940. Machine coating started here in 1933.

Its 1,500 employes now earn more than $6,000,000. Their national safety record in 1951, mill achievements and village activities were described. Soon to retire at Kimberly is the mill manager, Joe Doerfler, with 47 years service behind him.

Gary Equipment Sold

Agreement has been effected under which the Gary Paper Mill, a 40-ton plant at Gary, Ind., will be taken over on Jan. 1, according to John B. Miller, of Superior Paper Mills, 116 South College St., Tyler, Texas. The Indiana operation will be conducted under the name of Superior Paper Co. of Indiana. The Texas company has a de-inking process tested at Herty Laboratory, and newsprint made there was used by the Ft. Worth (Tex) Star-Telegram.

MORE THAN A QUARTER MILLION acres have been restored to full forest protection by the southern pulp and paper industry during the past five years, according to Henry J. Malsberger, forester-general manager of Southern Pulpwood Conservation Ass'n. Mr. Malsberger says the industry has paid for and caused to be planted a total of 277,000,000 pine seedlings during the period, or enough to fully stock 277,000 acres of 1000 seedlings per acre. Of this total, 201,000 was company owned and 76,000 small owner held acreage.

PINE SEEDLING PLANTINGS this fall and winter will reach an all-time total of 303,000,000 in the Southern states, according to Herbert C. Berckes, executive vice president of Southern Pine Ass'n., New Orleans. Twelve states are involved in the program.

New England Plant

Edwin J. Spiegel, president of Gaylord Container Corp., announced it has acquired a tract in excess of 10 acres at Union and Bircher boulevards in north St. Louis for immediate erection of a corrugated and solid fibre box plant. Gaylord's growth has made its present plant facilities in St. Louis inadequate and plans are for one of the most modern and efficient box plants in U.S., as well as one of the largest.

Mill Group Buys Wheel Chair

Because there were no suitable wheel chairs available to rent in either Seattle or Everett, the employes of the Weyerhaeuser pulp mill in Everett, Wash., led by Ray White of the storeroom raised funds to buy one. One employe, home from a hospital, had use for it and it will remain property of the employes.

New Bird Screens

Five new Bird Machine Co. screens have been installed ahead of No. 8 paper machine at Kenora, Ont., division of Ontario-Minnesota Pulp & Paper Co. Also a new 825 hp. steam turbine delivering 20-25 p.s.i. steam to No. 8 dryers was installed.

Scott's Plans at Everett

Scott Paper Co., already planning two tissue machines at Everett, Wash., will design its building to permit even further expansion, said President Thomas B. McCabe. As previously reported in PULP & PAPER, breaking ground for the first machine, which will be largest yet built for tissue, has been postponed until early 1953. The paper mill will be just north of the Soundview Pulp Division.

Gardner Mill Cafeteria

A new, modern cafeteria went into operation early this month at The Gardner Board and Carton Co., in Middletown, Ohio. It seats about 112 persons.

Pioneer Wisconsin Mill

The pioneer Atlas Mill in Appleton, Wis., which starts making wallpaper now for Kimberly-Clark to market (Katzenbach & Warren Inc., which designed and sold its products was acquired by K-C), made the first groundwood in Wisconsin 74 years ago. It also made the first sulfite west of Pennsylvania in 1887—a 9-ton mill with two deoxidized bronze digesters.

Krafco Election

George W. Scrimshaw, of Dallas, Texas, was elected chairman of the board of Krafco Container Corp., at Monroe, La. The company is allied with Brown Paper Mills, Monroe. Krafco has acquired the Kraftex Enterprises, Ltd., Dallas, Tex. The company opened an Atlanta office with Herman L. Moore in charge.

Marathon's New Building

Marathon Corp. acquired a 15-year lease on the Jersild 4-story building at Menasha, Wis., used by knitting mills, for printing, engraving and other expansion.

St. Regis Adds Lands

St. Regis Paper Co. has acquired management and cutting rights on 47,500 acres of land in Florida from J. W. Gibson Co. for a 60 year period. The land is on U. S. Route 90 in Madison and Hamilton counties, about 100 miles west of the new Jacksonville mill.

Kraft Mill Movie Is Available

Industry groups and associations may have free use of a dramatically filmed story of papermaking and conversion processes, making of bags, wrap and gummed tape at the recently expanded kraft operations of Hudson Pulp & Paper Corp., Palatka, Fla., PULP & PAPER is advised. S. W. Franklin, merchandising director, made the film. Running time, 41 minutes.

Reserve the film for your own use now, no obligation, of course, by writing: Film Lending Library, Hudson Pulp & Paper Corp., 505 Park Ave., New York 22, N. Y.

K
ONLY NASH VACUUM PUMPS HAVE ALL THESE FEATURES
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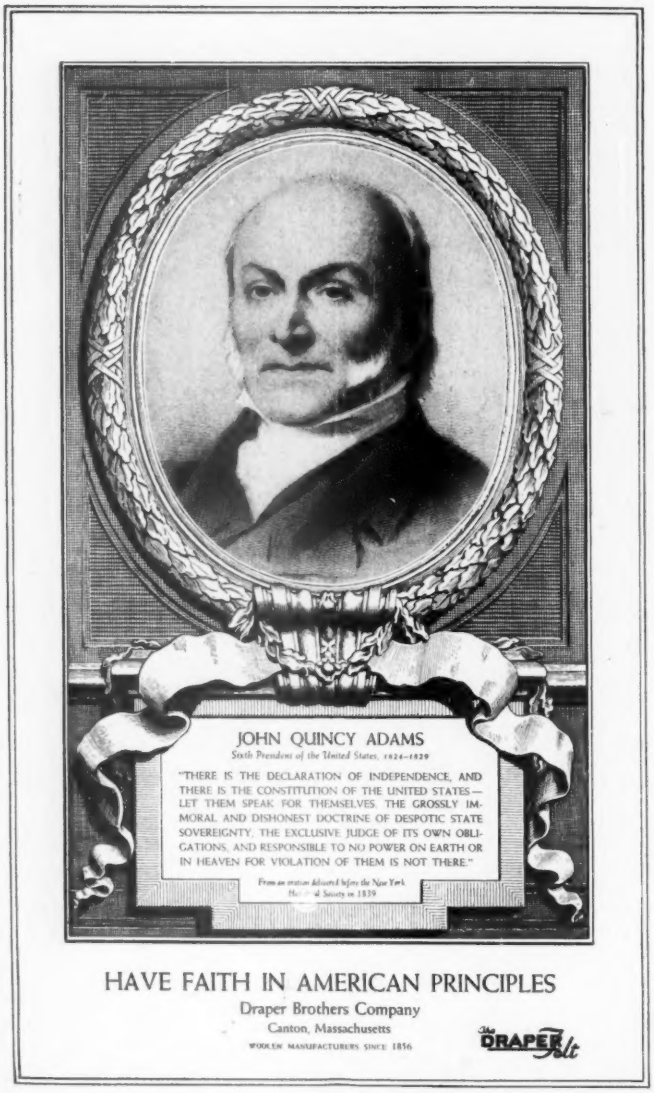
JOHN QUINCY ADAMS
Sixth President of the United States, 1824–1829
"THERE IS THE DECLARATION OF INDEPENDENCE, AND THERE IS THE CONSTITUTION OF THE UNITED STATES—LET THEM SPEAK FOR THEMSELVES. THE GROSSLY IMMORAL AND DISHONEST DOCTRINE OF DESPOTIC STATE SOVEREIGNTY, THE EXCLUSIVE JUDGE OF ITS OWN OBLIGATIONS, AND RESPONSIBLE TO NO POWER ON EARTH OR IN HEAVEN FOR VIOLATION OF THEM IS NOT THERE."
From an oration delivered before the New York Historical Society in 1839
HAVE FAITH IN AMERICAN PRINCIPLES
Draper Brothers Company
Canton, Massachusetts
WOOLEN MANUFACTURERS SINCE 1856
the DRAPER fold

FACTS ABOUT MARKETING OF PAPER

To anyone working in this industry, it seems evident that basic facts about the relationship of forest products to marketing should be an interesting subject. It would seem anyone who earns his livelihood anywhere in the mills or woods would want to know these facts.

A quick review of them is offered in this recent panel discussion. A typical paper user, jobber, seller and mill chemist were the program participants, and members of the audience took part, too.

The place and time might have been anywhere—it happened to have been a joint Governor of Washington State Dinner of the Keep Washington Green Association and the Society of American Foresters, Puget Sound Section.

Incidentally, a prediction that paper consumption in the U.S. would reach 400 pounds per person for 1951 was made by the paper jobber, Richard Abrams, West Coast Paper Co., Seattle. Last year it was 381 pounds.

PANEL ON PAPER MERCHANDISING answering questions: Left to right, Herb Willison, Forester, Crown Zellerbach, Port Angeles, Wash.; James Wenger, Chief Chemist, CZ Mill, Port Angeles; Kenneth Ross, salesman, CZ, Seattle; Arthur Poolton, the editor, "Paper User," and Richard Abrams, jobber, West Coast Paper Co., Seattle.

Some of the questions and answers were compiled for our readers by John Allen, secretary of the foresters group. Herb Willison, forester, Crown Z mill, Port Angeles, was chairman; a Port Angeles editor, Arthur Poolton, was "the paper user"; Kenneth Ross, a Crown Z salesman from Seattle, was the seller; James Wenger, chief chemist, Crown Z newsprint mill, Port Angeles, was the mill spokesman as "chemist." Here are parts of the dialogue:

The User: What types of paper are being manufactured?

Jobber: There are basically two types of paper, fine and coarse, with perhaps a third category being the heavy paper used to protect machinery and keep it from rusting. Fine paper includes letterheads, envelopes, pamphlets and booklets. The paper is produced from either sulfite pulp or rags. Coarse paper includes kraft, newsprint, napkins, bags, and converted items. This paper is produced from sulfate and/or groundwood pulp.

User: What are the market units?

Jobber: Measurement of newsprint at the mill is in ton units. The jobbers handle it in hundred weights. Bags are handled in bales of thousands. Toilet tissue, napkins and similar items are also handled in bales. Coarse paper may be sold in sizes of 24" x 36", but this varies with the type of paper.

User: What about the middle man?

Jobber: He is called a jobber. He receives the paper in large quantities, perhaps by carloads. In his warehouse he breaks the large units down into case lots for distribution to the retailer.

User: Are there standard paper grades?

Salesman: There are very definite standards for paper, whether it be manufactured from rags or by kraft or sulfite process.

User: What above the flexibility of pulpmills on changes in order for various types of paper?

Chemist: In readjusting machines to the various types of paper, minutes to hours may be lost.

User: What is the minimum quantity that can be run, of any one paper?

Chemist: With a machine of 15 tons daily capacity a five-ton order would be acceptable as the machine would be down but three times per day with a very slight loss in production. But with a 200-ton machine five-ton orders are not possible. At that rate there would be too many changes per day with resulting loss in production.

User: How is a new paper customer treated with his specifications?

Chemist: The laboratory makes small samples and then trial runs are made until the correct paper for the new customer is obtained.

Chemist: There are two variables: the machine and the material put into the machine. To achieve certain results various types of pulp are blended together. There are three basic processes and various mixes of species can be used with each process.

Process	*Species*
Mechanical	Red or white fir, hemlock, cottonwood.
Sulfite	Hemlock, white fir, spruce.
Kraft	Pulp anything, just about.

User: How is a new market or paper use developed?

Seller: The development pattern is to produce a better paper for some particular use, or to make some paper that previously has been made only in the East and shipped into the territory.

User: Who converts roll paper into a final product?

Jobber: Kraft is converted right at the mill in about 100% of the cases. Printing paper's conversion is more variable and may be shipped out of the mill in rolls. Converted items like toilet tissue may be converted at the mills from rolls or shipped to jobbers for conversion.

User: What are the main causes of paper shortages?

The Jobber: Paper consumption in the U.S., per capita, has steadily increased—from 58 lbs. in 1900 to 240 in 1936 and 281 in 1950. It is expected to be 400 lbs. per person for 1951. The tremendous estimated consumption for 1951 is

due to many new paper uses, such as milk bottles, frozen food packages, facial tissue and more printed matter in advertising. The increased demand and population growth have prevented production from keeping up with demand. New pulp units are expensive. They require a minimum investment of four to five million dollars.

A question from the audience: What percent of the 400 pounds per capita in 1951 would be new pulp? No one on the panel would hazard a guess. They explained that buying of old paper for re-use is expanding significantly. Today old newspapers are worth $12 per ton, old magazines $14 per ton and used kraft cartons $20 per ton. To just what proportions this salvage material would be used they did not know.

Another asked what percent of paper is used to make government forms. An answer of 110% brought laughter.

The jobber, in answer to a query, said the present price of paper is about 12 cents per pound.

A question: What would four or five million dollars buy in pulping equipment? The jobber answered that a 197-inch machine recently installed cost $11,000,000. An 87 to 96-inch, average, machine would require an investment of about $5,000,000.

Col. William B. Greeley, nationally known ex-U.S. forester, in the audience, asked about the possibilities of replacing wood with other materials for pulp. The chemist, Mr. Wenger, replied that most pulp would come from wood for many years to come. He said that in speaking of paper pulp we do not include that used for rayon or for other non-paper uses.

The jobber said two Pacific Northwest mills which use waste paper in making boxboard now cannot meet the demand. A mill in Seattle would have good markets, he said. It could make chip-board, requiring waste paper plus a rosin or glue binder.

Another Dairypak Plant

Clarke Marion, president and general manager of Dairypak, Inc., Cleveland, Ohio, has announced plans for a third Dairypak plant at Clinton, Iowa. The firm now operates at Cleveland and Athens, Ga. Walter Faber, assistant to the general production manager at the home plant in Cleveland, is named as manager of the Clinton operations, to get underway by September. Dairypak, Inc., is owned jointly by Champion Paper and Fibre, and Gardner Board and Carton Co.

Unusual Chemical Plant At Marathon, Ontario

Marathon Paper Mills of Canada is now operator of the only chemical plant of its kind in the western hemisphere, equipped to produce 50 percent caustic soda simultaneously with sodium sulfide.

The plant at Marathon, Ont., which went into production this fall, will provide chemicals for high grade bleached sulfate pulp.

Designed by Monsanto Chemical Co., the plant's engineering was directed by Leonard Construction Co. of Chicago. The plant produces chlorine, caustic, sodium sulfide and hydrochloric acid together with the Achille modification for simultaneous production of sodium sulfide.

Grab the phone

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SALES ENGINEER

Sales and Service representative to live in Pacific Northwest and call on pulp and paper industry. Prefer graduate mechanical or chemical engineer. Age 30-40. Reply to Personnel Director, Oliver United Filters, Inc., 2900 Glascock Street, Oakland, Calif.

WANTED — EXPERIENCED ENGINEER

Younger man to work in Engineering Department, ELECTRIC STEEL FOUNDRY, Portland, Oregon, handling orders, estimates, and field service for Pulp Mills, Chemical Plants, and allied industries. Some traveling. Write, giving education, personal history, experience record, and any other qualifications. If interested, will arrange for a personal interview.

DESIGNERS, DETAILERS, LAYOUT DRAFTSMEN FOR BOARD WORK with old established manufacturer of medium and heavy machinery. Men with paper mill machinery experience preferred. Permanent openings, excellent salary and working conditions. Hospital and surgical benefits. Resume covering work, technical history, and salary expectancy required. Address *PULP & PAPER*, Box 126

FOR SALE

One USED 204" Trim, two drum Bagley & Sewall winder, complete with slitter equipment. In good condition.

One USED Carthage 4-knife chipper. In good condition.

For further information write to P&P Box No. 133, c/o PULP & PAPER, 71 Columbia Street, Seattle 4, Washington.

Dr. Libby At Jacksonville

Dr. C. E. Libby, former head of the paper school at Syracuse who heads a new paper school at the University of North Carolina, was featured speaker at Southeastern TAPPI session in Jacksonville Nov. 21. He reviewed progress in semi-chemical pulping.

Alberta Project has New Name—No Mill Yet

Revised plans for building of a 200-ton chemical pulp mill near Edmonton, Alberta, by Beverly Pulp & Paper Co., represented by R. O. Sweezey of Montreal, have been announced. The Beverly name replaces Edmonton Pulp & Paper Mills. Under an agreement with the Alberta government, construction must start before Jan. 1, 1953, but Mr. Sweezey told PULP & PAPER availability of supplies will determine when it can be completed.

MEN WANTED—POSITIONS OPEN

We can place—Supts., night supts. and asst. supts. for Cylinder and Fourdrinier mach. paper mills; Manager gumming plant; mgrs., supts., foremen and mechanics for converting plants; mgr. bag mfg.; day supts., night supts. and asst. supts. board mills; supt. for asbestos cement shingles, flat sheets and corrugated board; board mill coating supervisor; asst. treas. and general accountant for southern paper mill.

Chemists, chem. engineers and laboratory men; purchasing agents and asst. purch. agents; pulp and paper technologists; plant engineers, asst. plant engineers, mech. engineers, master mechanics, maintenance and mach. shop foremen, designers and draftsmen, salary range $5,000 to $10,000; Cylinder and Fourdrinier mach. foremen; power supervisors; salesmen to sell fine papers, newsprint and board, also salesmen and demonstrators to handle chemicals and other materials for pulp and paper mills and paper converting plants; beater engineers; mach. tenders and back tenders.

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open in the pulp and paper mills.

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SPECIALISTS IN PLACING AND IN SUPPLYING
PULP AND PAPER MILL EXECUTIVES

New Kraft Producers Group

Nine producers of kraft paper and products have formed the Kraft Products Manufacturers Export Assn. with offices at 521 5th Ave., New York City. First officers are: W. C. Shorter, Camp Mfg. Co., president; Leonard Doyle, Union Bag & Paper Corp., vice president; and Israel B. Oseas, secretary-treasurer.

In addition to Camp and Union Bag, other initial members are: Albemarle Paper Mfg. Co.; Arizona Chemical Co.; International Paper; St. Regis Paper; Gilman Paper; Hudson Pulp & Paper, and Hollingsworth & Whitney.

ANTARA CHEMICALS DIVISION of General Dyestuff Corp. has published a new brochure, "Trouble Shooting With Blancol," describing the use of Blancol Conc. Powder and Blancol Conc. Fine Powder N in processing pulp and paper. Copies of this brochure may be obtained from the Antara Div., General Dyestuff Corp., 435 Hudson St., New York 14.

LOUIS ALLIS CO. of Milwaukee, Wisc., originators of the fan-cooled motor for use in hazardous locations, announces a new 12-page bulletin covering its line of explosion-proof motors. Copies of bulletin No. 800, may be obtained from Louis Allis Co., Milwaukee 7, Wis. or from district sales offices or distributors.

DENVER EQUIPMENT CO.'S new Super Rougher Flotation Machine is now in quantity production. This machine is designed for roughing and scavenger flotation. It features low level froth overflow on both sides of machine; an open type tank for pulp flow and super aeration. Bulletin No. FLO-B69 describing the machine will be sent on request.

RELIANCE ELECTRIC & ENGINEERING CO., Cleveland, O., has issued a 4-page, quick-reference bulletin, describing and illustrating its principal products. Copies are available on request. Write to Reliance, 1088 Ivanhoe Road, Cleveland 10.

News and Notes from ■ ■ ■
EQUIPMENT AND SUPPLY COMPANIES

J. E. RHOADS & SONS, 35 No. 6th St., Philadelphia, has published a 40 page handbook on specific applications of their leather belting in this industry. Based on premise that proper selection, installation and maintenance of belting for paper machine cone drives is a key to maximum efficiency, the book devotes 23 of its 40 pages to these subjects.

HANNA ENGINEERING WORKS, 201 No. Wells St., Chicago 6, is distributing a new technical bulletin "Cylinder Power in Action" illustrating 16 cylinder powered movements and showing 21 actual application photographs. Hanna states there are over 1001 ways throughout industry that hydraulic or pneumatic cylinders can be used to push, pull, lift, press, clamp and control.

MINNEAPOLIS-HONEYWELL REGULATOR CO. announces appointment of C. L. Peterson as general sales manager of the Industrial Division. Mr. Peterson has been regional manager for Honeywell's midwest region in Chicago since Jan. 1950. He succeeds W. H. Steinkamp. Mr. Peterson was graduated from the U of Calif. and joined company in 1927 as sales engineer in San Francisco. In 1945 he was appointed regional manager for the parent company's Pacific region. The appointment of *EDGAR ANDREWS* as paper industry manager has also been announced. He has been industrial manager of the firm's Jacksonville office and for past five years has handled paper industry accounts in the Southeast. He succeeds Harold Sholl and takes up residence in the Philadelphia headquarters.

LINK-BELT CO., Chicago, announces a big step forward in standardization and simplification of conveying equipment, resulting in faster delivery and lower cost to customer. Positive action Flexmount oscillating conveyors in any desired length can now be ordered and built by the purchaser from factory subassemblies available from stock. Complete guides to correct selection and application are offered in Book No. 2478.

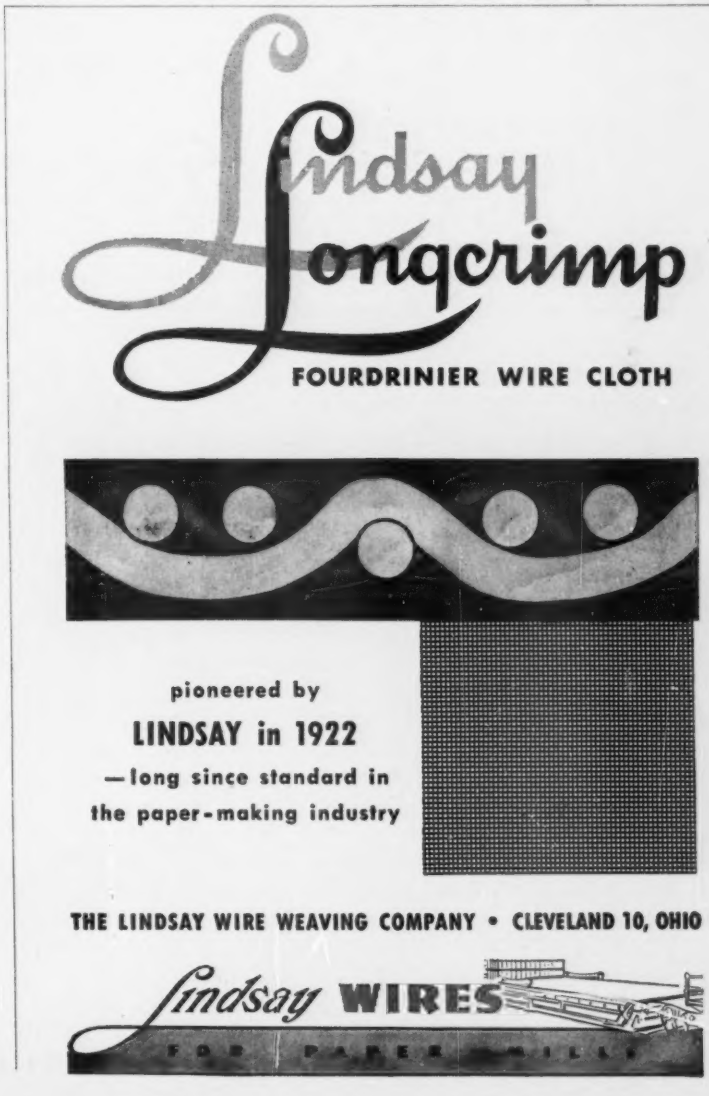
FOSTER WHEELER CORP. is issuing a new illustrated, 36 page catalog on cooling towers. The booklet contains details of construction, etc.

HOOKER ELECTROCHEMICAL CO. has transferred two chemical engineers, John T. Walmsley and Frederick W. Bonacher, Jr. to the sales coordination office of the sales department at Niagara Falls, N.Y. The company also announces appointment of Horace W. Hooker, Jr. as assistant to the general sales manager, Peter N. Maclaren as purchasing agent and Robert F Schultz as assistant technical superintendent. Mr. Hooker has been associated with the company since 1934. He was graduated from Cornell University. Mr. Maclaren attended Bishop's College, York, England. He has been with the company since 1936. An engineering graduate of Univ. of N.D., Mr. Schultz has served as technical foreman of the fine chemicals department.

E. D. JONES & SONS CO., Pittsfield, Mass., have just issued a 6-page brochure in full color giving design and technical data on their cartridge type propeller agitators. Illustrated by photographs and a complete schematic drawing, the brochure provides detailed information and a drawing giving dimensions for nine different sizes of agitators. Copies are available upon request. Ask for Bulletin EDJ-1037.

FAIRBANKS, MORSE & CO., Chicago manufacturers, announce that W. E. Watson, who has for several years been manager of the Pump Manufacturing Division, has been promoted to assistant to the manager of manufacturing, Chicago; Paul R. Flood, since 1950 manager of manufacturing of the Beloit, Wis., works, has been transferred to Pomona, Calif., as general manager of the Pomona Works succeeding Charles L. Barrett who has become a consultant to the Pump Division.

Man uses paper more than any other commodity except water. You are in an indispensable industry.



APA Lake States Meeting

(Continued from page 90)

11.8%. The highest production obtained was 9.5 peeled cords/hr. for a two hour period. When mechanical difficulties are corrected, Mr. Salter felt a production of 72 peeled cords per 9 hr. day (8 peeled cords per hour) was possible providing no moving of the machine was required. 60 peeled cords per 9 hr. day (6.67 peeled cords per hour) is possible when a move is made.

The power to operate this unit is transmitted through a fluid coupling, into a truck transmission, and then to a differential. At this point power is divided to operate the drum and the jack ladder. The bottom of the barking drum has been enclosed so bark will fall into the rubber belt conveyor and a discharge hopper has been added to prevent spilling of peeled bolts.

Mead Corporation: This barker is mounted on a Fruehauf trailer which is pulled by an F226 Reo 6x6 truck. On this truck is mounted a Schield-Bantam crane equipped with a 1200 lb. one-half cord capacity clamshell grapple. Rough winter-cut poplar is piled 3½ feet in height in double decks spaced to permit passage of the entire unit between the piles in their several concentration yards. Manned by a crane operator, a barker operator, and one laborer—wood is fed into the barker by the crane, barked, and then discharged onto the ground with no attempt to clear the landing.

Having barked 1743 rough cords of poplar within 65 days of actual operation and having travelled 200 miles, a maximum production of 54 rough or 47.6 peeled cords per 8 hr. day was reached. This averaged 6.75 rough or 6.0 peeled cords per hour. On well laid out yards production should average 60 rough or 53 peeled cords per 8 hr. day. The calibre of crane operator sets the pace. Mr. Bruning also noticed that the barking of poplar became more difficult as the season progressed.

C. L. Durkee (D. J. Murray) said latest drums are being constructed of solid plate instead of individual rings. This, with wider space bars in the bottom, should force the bark to the bottom and onto a conveyor or belt. Additional ripples or brushes must be added to retain the barking capacity of the older type drum. Latches on doors are being improved and consideration given to door relocation and design.

Ware Attachments For Handling: Edward Kruse of Oliver Corp., informed the group that Ware was working on two types of loaders which would prove beneficial to the pulpwood industry. First, the Ware Model "B" Loader as mounted on an Oliver Hillside "B" crawler tractor is being equipped with a grapple which will permit the handling of a quantity of pulpwood not exceeding 6000 lbs. in weight. Representing a $9-$10,000 investment this machine must function as a loader of trucks or sleighs from piles of banked pulpwood to assure a high production. This is in contrast to the Vercillino-Ware Pulpwood Loader which is normally mounted on an OC-3. The smaller machine, with its cost approximately $3750, can be effectively operated by a small jobber whose productive capacity is not great. Because track flotation of the OC-3 can not permit operation of this loader in soft swampy terrain, Vercillino mounts a model "HGH" Ware loader with hydraulic tongs on an Oliver Model "A" tractor. In loading trucks, however, the OC-3 will outproduce the larger tractor because of its speed. This machine can handle a 2000 lb. load.

At present Ware is developing an attachment for the rear of an Oliver "88" Tractor which will permit positioning control of the grapple attached to the end of a telescopic boom. All controls will be hydraulic and so absolute that an inexperienced operator should be able to effectively load, unload, or transfer rough pulpwood after a few hours or days of operating experience.

Long Distance Hauling

R. R. Edgar, logging engineer for Wm. Binifas Lumber Co., led discussion of long distance hauling with trucks. He described experiments conducted at Bonifas with two types of truck-trailer units—one an LF-190 International with tandem drive combined with a custom built 32-foot semi-trailer equipped with a tandem Hoobler axle assembly; and the other being a similar truck but with a 22-foot custom built Fruehauf trailer. Figures kept on operation of the smaller unit showed a cost per hour on the job of $3.29 including depreciation, license, insurance, taxes storage and wages.

Buel Elected Chairman

Bruce Buel, of Northern Paper Mills, was elected chairman of the Lake States technical committee at a business session of the APA group and R. D. Salter, of Consolidated Water Power and Paper, was named vice chairman. Next meeting was scheduled for December 9 at Spaulding hotel, Duluth, Minn.

Foresters In Joint Meeting In Montreal

Leaders in forest industries of Canada and the U. S. participated in the joint meeting of the Canadian Institute of Forestry and the Society of American Foresters at Montreal Nov. 17-20.

Forest education discussions were led by Robert P. Holdworth, University of Massachusetts, and Dean J. W. B. Sisam, Toronto University, as co-chairmen.

K. G. Fensom, of the Forest Products Laboratory, Vancouver, B. C., and president of the Canadian Institute, gave a welcoming address at a session, presided over by Dr. M. A. MacDonald, director of the forestry branch, Department of Resources and Development, Canadian government. The response was by George L. Drake, Simpson Logging Co., president of the Society of American Foresters, followed by an address by A. W. Bentley, woodlands manager, Bowater Southern Paper Corp., Calhoun, Tenn.

Canadian Pulp and Paper Association was host at a luncheon. Chairman was Elliott M. Little, president of Anglo-Canadian Pulp & Paper Mills, with Prime Minister St. Laurent as speaker.

At a silvicultural session co-chairmen were Harold J. Lutz, of Yale, and George S. Allen, University of British Columbia. Forest management was presided over by Gordon Godwin, assistant general manager, woodlands, Ontario Paper Co. and E. B. Moore, Trenton, N. J.

Economics and taxation were dealt with at a session with Dr. Ralph Marquis, Northeastern Forest Experiment Station, and Dr. J. Miles Gibson.

PULP MILLS have big stomachs...

Some folks call them digesters; some call them autoclaves or pressure cookers. They digest a belly-full of wood chips in the same way a man digests a beef steak—chemically and mechanically.

From that point forward papermaking is a succession of washings in clean water and of forming the beaten pulp into sheets. After the sheet has been formed the remaining water is pressed out through the open spaces between the threads of the felts and evaporated at the drier rolls.

You can't manufacture paper or board without felts. Every papermaker knows that. Most of them also know that you can't buy better felts than Hamiltons because no others remove water faster and none give finer finish to the sheets than Hamilton Felts.

With more than 300 different styles from which to select, the Hamilton sales engineer is in position to suggest the best felt for your purpose.

Hamilton Felts

MIAMI WOOLEN MILLS • Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Personals

PACIFIC COAST NOTES

C. L. KOERNER of Portland, Ore. attended the Engineers meeting in Chicago and spent another week in the Midwest visiting Propellair Division of Robbins & Myers, Inc. at Springfield, O., and Roots-Connersville Blower Division, Connersville, Ind. in addition to other companies. He represents these concerns on the Pacific Coast.

J. R. BURKETT, dyestuff department, Calco Chemical Division, American Cyanamid Co., Bound Brook, N.J. was a Pacific Coast visitor last month. Mr. Burkett called on Roy Keller, California manager, Pacific Coast Supply Co.

CROWN ZELLERBACH CORP. promotions at Camas, Wash.: *WALTER C. JACOBY*, technical supervisor, named assistant sulfite superintendent in charge of acid plant, digesters, black liquor making and bleach plants; *O. C. WHEELER*, sulfite shift foreman, promoted to assistant sulfite superintendent in charge of screening, stock segregation, wet room, kamyr, filter plant and water supply; *W. H. SHOCKLEY*, promoted from assistant technical supervisor to sulfite mill shift foreman; *D. F. CHURCH*, assistant technical supervisor, promoted to technical supervisor and *R. G. STEWART* named assistant technical supervisor. *F. W. STOLTZ*, assistant bag factory superintendent, replaces *B. H. REED* as superintendent of bag factory (the latter has taken 3 mos. health leave); *H. B. SCOBBA*, named assistant superintendent of converting plant and *J. A. BUTTERICK* replaces Mr. Scobba as napkin department foreman.

CROWN Z's Camas, Wash., pin dinner presented pins to 216 employes with the organization from five to forty years. The awards denoted over 2200 man years of service. H. L. Zellerbach, CZ executive vice president, presented the pins; Frank A. Drumb, resident manager, officially welcomed the group; and E. A. Paul, supervisor of industrial and community relations, presided as master of ceremonies.

MABEL BATEMAN, receptionist at general offices of Weyerhaeuser Timber Co., Longview, Wash., had her picture and a writeup in a recent issue of Weyerhaeuser magazine. It said she was "probably the best known employe at Longview" and from the number of mill visitors she greets, this must be so. Incidentally, the writeup gave her recipe for sweet Virginia pickles.

G. W. HULDRUN, JR., has been named sales manager, Eastern Division, of Shell Chemical Corp. and V. C. IRVINE has been appointed Western Division sales manager. This announcement was made by *J. OOSTERMEYER*, president of the company.

PHILLIP SCHNABEL, JR. has been named to new position of assistant pulp mill superintendent of St. Helens Pulp & Paper Co., St. Helens, Ore., according to *MAX R. OBERDORFER*, executive vice president. Mr. Schnabel was with Potlatch Forests, Inc. pulp division engineering department prior to taking on present position.

CLIFFORD C. FELTON, formerly of accounting department, has been named purchasing agent at Fir-Tex Insulating Board Co., St. Helens, Ore. *PAUL VANCE*, who has been functioning in dual capacity as purchasing agent and wood supply superintendent, can now concentrate on raw product supply.

VANCE V. VALLANDINGHAM is new manager of research and development for Potlatch Forests, Inc., paper division, Lewiston, Idaho. Mr. Vallandingham's new position will be concerned with new developments, technical services, and will coordinate production and quality control problems. For the time being he will continue his residence in Chicago and will divide his time between the plant at Lewiston and the company's customers.

NILS J. LINDBERG, Finnish engineer, arrived at Camas, Wash. in September to spend two or three months working with CZ Central Research Dept. He is in U.S. under Walter Ahlström Foundation scholarship to learn the industry.

LEE SHANNON, paper machine shift foreman, CZ Corp., Camas, Wash., retired Oct. 1. He completed 41 years of service with the organization last June and has taken optional early retirement to develop his real estate.

G. H. GALLAWAY, assistant resident manager, CZ, Camas, Wash., attended a meeting of the newly formed *TAPPI* training and education committee Sept. 10-11 at Union Bag & Paper plant, Savannah, Ga.

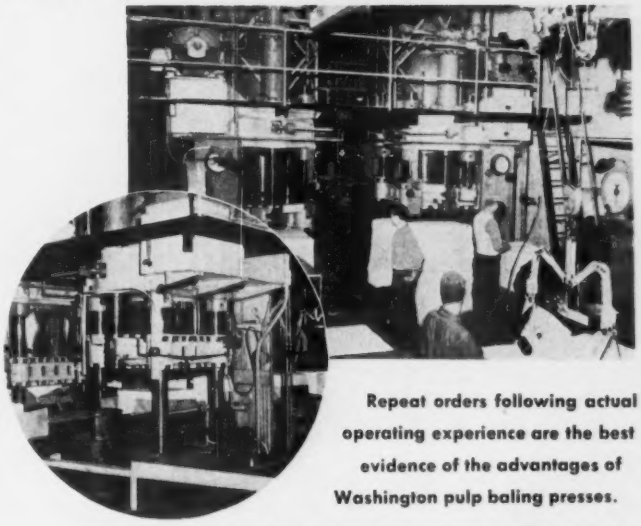
JERRY RENISON, Board mill, Stockton, Calif. Division of Fibreboard Products, Inc. was presented the Annual Suggestion Award of $100 by *C. KINSER*, assistant container department superintendent and chairman of the suggestion committee.

O. E. LARSON, Pacific Coast representative for Emerson Manufacturing Co., has moved from Oakland, and now resides at 166 Lake Ave., Piedmont, Calif., phone: HUmboldt 3-2291.

New Rayonier Offices Have Hidden Stairway

A hidden stairway behind a sofa and potted plants features the magnificent offices of Rayonier Incorporated, occupying the 24th and 25th floors of the Chrysler Building East, New York. To facilitate going from floor to floor without using public elevators, the stairway was constructed so that it enters the main reception room.

Rayonier Again Selects
WASHINGTON PULP BALING PRESSES



Repeat orders following actual operating experience are the best evidence of the advantages of Washington pulp baling presses.

The two 1000-ton units illustrated above were installed in the Hoquiam, Washington, plant of Rayonier, Incorporated, in 1951, replacing 600-ton presses of older type. The higher capacity, ease of control and increased production engineered in the new presses have enabled the mill to raise efficiency in the baling press department. Two similar 1000-ton Washington pulp baling presses have since been ordered by Rayonier, Incorporated, for installation in the new mill at Jesup, Georgia.

Washington Iron Works is the leading western manufacturer of pulp baling presses and of hydraulic hot presses specifically engineered for plywood, door and hardboard production. Inquiries for either standard or special types of presses are invited.

WASHINGTON IRON WORKS
Since - 1882

WASHINGTON IRON WORKS

1500 6th Avenue South — Seattle 4, Washington

EXPEDITING SHIPMENTS

By J. W. Weiblen
Finishing Supt. Columbia River Paper Mills, Vancouver, Wash.

Sealing of cut size reams has been advanced considerably with the development of an automatic ream packager by Lynch Corporation of Toledo, Ohio, and called Model E Morpac Machine. An article in detail has been printed in the issue of Paper Mill News, January 20, 1951. Highlights of this model Morpac machine are its ability to package 900 to 1000 reams per hour in reams sizes ranging from 5½" X 7½" X ¾" to 10" X 15" and 5" thick. Labor saving in sealing of 900 to 1000 reams, as compared with an average of 120 reams per hour in hand sealing is obvious and self explanatory. The use of glue in place of tape and the smaller amount of wrapper used with Morpac Automatic sealing machine is quite a material saving item.

In the conventional method of sealing, a man lifts a ream from a trimmed load, turns and places it on a wrapper, draws wrapper tight around ream and seals with a piece of gummed tape. The ream ends are folded and taped. Time lost in sealing reams in this manner is in picking up ream from supply load, turning ream to seal ends, and placing it back on a load for labeling and packing in shipping containers.

Although we have not developed an automatic sealing machine, we do have a four man system of sealing that has increased sealing of packages from an 80 ream average to 125 ream average per man hour. You can readily understand four men sealing 500 reams per hour requires a steady flow of paper from a trimmer. We have accomplished this through our conveyor system of paper trimming.

Lifts of paper placed on unloading table from number two trimmer are sent to sealing section. A sealer man on each side of table slides a ream of paper from lift onto a supply of properly cut wrappers; while one man draws wrapper around ream, the other man applies a predetermined length of gummed tape, as might be supplied from a Model 120 Counter Boy sealing machine. With a slight motion the partially wrapped ream is sent to the next sealers who fold the ends and tapes. The ream is then slid to a labeler who labels and places into container for packing.

Because of various methods used of packing ream wrapped paper in each finishing department, I will attempt to point out one which could be readily used in conjunction with a trimmer and sealing set up that I have just described.

A carton sealing machine method is now being used in several Coast Mills and no doubt throughout the paper industry. One of the better methods of carton sealing is with a turn table type of taping machine, such as manufactured by Better Packages Inc., of Shelton, Conn.

A loaded carton placed on a roller conveyor is automatically turned over. It enters the turn table sidewise. A pressing device with a ton of compressed air behind it squeezes out all air between the reams of paper in the carton. Air pressure remains on while carton is turned and tape is applied.

A special moistening process moistens tape as it is guided around edges of carton as it makes a complete revolution; after which the tape is automatically cut. While still under pressure the operator folds down tape to the cartons, turning the table as he does so. When carton is finished the air pressure is released and carton is moved onto load. As loads are assembled, cartons are properly stenciled with necessary markings and paper is ready for shipment.

An inexpensive and fast method of sealing cartons is by stapling. Although stapling of telescope cartons is not widely used and customer acceptance not assured; we know through experiments that labor and material costs will amount to as much as $1.00 per ton.

International Staple and Machine Co. of Havertown, Penna. manufactures pneumatic stapling machines, both stationary and portable, with a retractable anvil feature which accurately drives staples into the carton sides, clinches the staple without damage to carton.

A well organized system of paper work, as well as any necessary mechanical handling equipment, helps to expedite shipping of paper as well as invoicing customer upon shipment.

What's corn doing "deep in the heart of Texas"?

Research discovered that drilling for oil could be expedited by the use of a binding agent made of a product of corn. This firmed up the side walls . . . also aided in the early flow of sludge. "Black gold" speeded by yellow corn! This is but one of the numerous examples of how continuous basic research in corn helps American industry . . . helps you.

Corn products in paper manufacture

Starches and adhesives . . . superior formula ingredients for such processes as beating, corrugating and laminating . . . and other new techniques for using various corn products are being developed and refined by Corn Products Refining Company.

If you have a production problem why not check with Corn Products? A complete line of corn products for every purpose is available. Technical service is yours . . . no obligation, of course.

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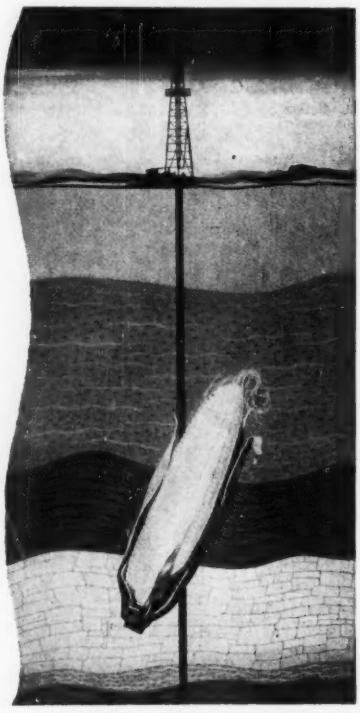
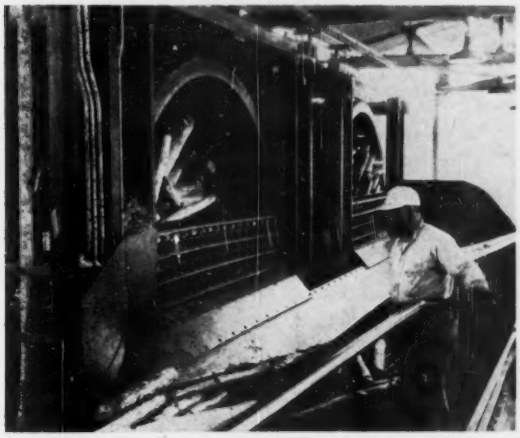
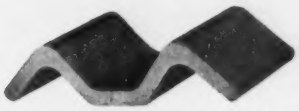
GLOBE STARCH® **AMIJEL®** **CORAGUM®** **LAM-O-DEX®**



BARK HARD OR SOFT WOODS UP TO 8' IN LENGTH WET...DRY...OR COMBINED DRY AND WET WITH F.M.P. WELDED M-BAR BARKING DRUMS





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Exclusively used in F.M.P. drums
Welded and riveted to heavy ship channels

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Barking drums can be furnished with long or short column steel frames to fit customer's requirements.
Drumshells shipped completely shop-assembled.
Built-up drumshells and steel frames fabricated at Birmingham, Chicago, and Greenville, Pa.

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Manufacturers of Barking Drums since 1915, welded drumshells since 1933

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This newest guide of the 50 year old Gilbert and Nash line features Low Head design and enclosed reduction gear. Speed to 2000 1/min. Engineered throughout to traditional Gilbert and Nash standards. Write for complete specifications.

Gilbert & Nash Company • Appleton, Wisconsin

A CYCLONIC JOB OF PULP CLEANING

Centri • Cleaners are made in two types. The Howard Smith type is No. 622 series (illustrated). The Hammermill type is No. 600. Both are described in our Bulletin No. P-4.

Until you see the debris removed from pulp by Centri • Cleaners, you can hardly believe that such an achievement is possible. The astonishing fact is that Centri • Cleaners reject bark fragments, shives, and pitch along with heavy dirt.

Because of the thorough job done by Centri • Cleaners, pulp stock comes out cleaner than by any other method. What's more, investment and operating costs are relatively low for the production of premium quality pulp, paper, and boards.

The only power requirement in connection with Centri • Cleaners is pump operation, which amounts to about 1 hp per day per ton of dry fiber.

In this space we cannot explain the system, but we have fully descriptive literature and exhibits which will be gladly sent to mill executives upon request. Write, wire, or phone us.

THE BAUER BROS. CO.

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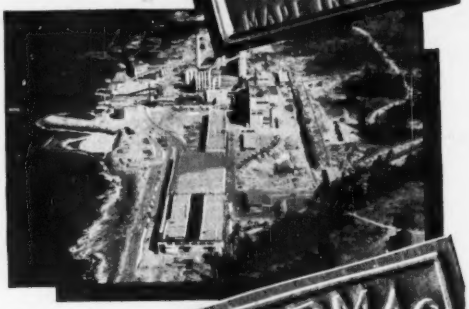
Mill at Port Alberni

BLOEDEL SUPERTARE KRAFT



Mill near Nanaimo

HARMAC BLEACHED SULPHATE

Two great mills, producing bleached and unbleached Sulphate pulp, provide a reliable open market supply for discriminating buyers.

The "brightness" of HARMAC pulp with the chlorine dioxide system of bleaching, and the "cleanliness" of BLOEDEL KRAFT, are features that contribute to the popularity of these products in world markets.

Rail and deep sea facilities at both mills.

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PUT UP TO STAY UP!

That's the word of a large midwest manufacturer. Twenty-one years of service without need for repairs prove to him that, with a GRID installation, first cost is last cost. Such service records (GRID installations made in 1929 are still operating) are the rule rather than the exception with GRID Unit Heaters because GRID was deliberately designed to be a better unit heater. To provide not only ample, comfortable heat, but to give years of service without the usual high maintenance cost generally experienced with ordinary unit heaters. Such service records occur because GRID is completely different from other unit heaters—Here's how:

GRID is an all cast unit with finned heating sections and headers tested to withstand steam pressures up to 250# P.S.I.

GRID construction uses no brazed, soldered, rolled or welded connections between condenser and headers. A specially designed threaded nipple assures a precision, leak-proof fit.

GRID construction has all similar metals in contact with steam, thus preventing electrolytic corrosion which eventually occurs in copper type unit heaters where steam passes from iron pipes into copper cores. (Write for booklet CORROSION IN UNIT HEATERS).

GRID construction resists corrosion from fumes present in most types of industry.

GRID design incorporating low outlet temperatures, proper fan sizes and motor speeds, assures delivery of warm comfortable air in ample volume to the working level. No stratification of warm air at the ceiling to waste your fuel dollars.

These are the reasons why users of GRID Unit Heaters get 21 years and more of trouble-free service. There are units cheaper than GRID, but there is none better.

You start saving money the day you install GRID Unit Heaters.
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Getting Back to Fundamentals

In book paper, proper calendering makes a big difference in qualities that are important to your salesmen — clean reproduction, easy reading.

The finish on a paper can only be as good as the rolls in the calender. That is why many of America's leading paper manufacturers are standardizing on Butterworth Calender Rolls. They've found they get superior results with Butterworth Rolls at low cost.

We invite you to make this simple test . . . Place one Butterworth Roll in the stack with any other roll or set of rolls. Examine the true, even surface. Time it. See how many hours it runs without requiring turning down or refilling.

Butterworth Calender Rolls are locked on the shaft under tremendous pressure. They cannot slip . . . cannot come loose. The heads and shafts are of forged steel. Butterworth Rolls are built for every calendering need. We can also refill your present rolls. Write us today for a quotation on your requirements.

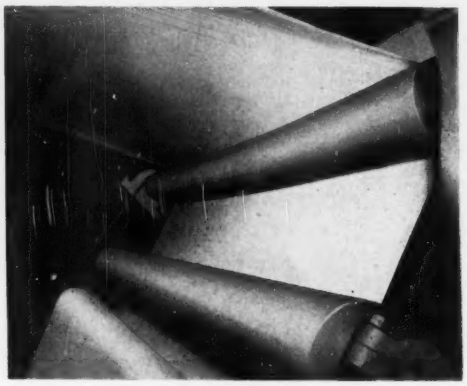
For full information, write or call H. W. Butterworth & Sons Company, Bethayres, Pennsylvania – 187 Westminster Street, Providence, R. I. : : 1211 Johnston Building, Charlotte, N. C.

Butterworth
CALENDER ROLLS

Keep Your Size Press Operation

in the Black!

Mount Hope FREE WHEELING EXPANDERS



Leading Paper Mills in the United States, Canada and Europe report: "Mount Hope Ball Bearing Free Wheeling Expanders improve paper machine operations to such an extent that no mill can afford to operate without them!"

Your own experience will prove that these devices can eliminate waste, increase operating speed, improve quality obtained from your paper machines, calenders, coating machines, slitters, rewinds, etc.

MOUNT HOPE MACHINERY COMPANY

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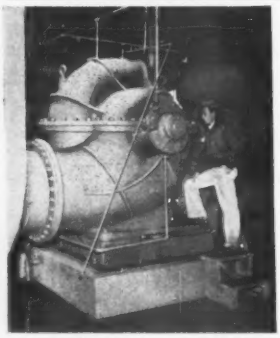
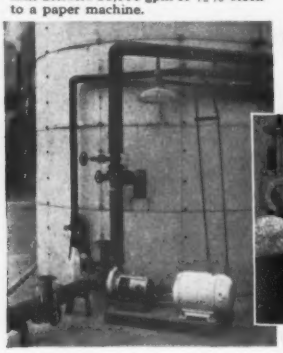


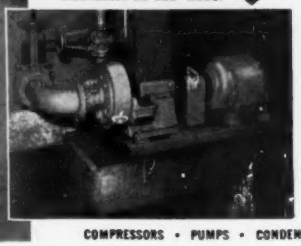
This 24 CFV fan pump at a Southern mill delivers 28,000 gpm of ½% stock to a paper machine.

service water
sizing
stock
liquor
chemicals
white water



One of several I-R chemical pumps used on sizing circulation service at a paper mill.

A 4 EGV pump moving 3½% stock from a surge tank to thickeners at 125' head.



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Ingersoll-Rand's pump line includes units of the right type, capacity and pressure for *every* paper mill application.

Stock pumps are available in a wide range of vertical and horizontal designs, to provide the best arrangement for any installation. Their design features assure maximum availability under severe service.

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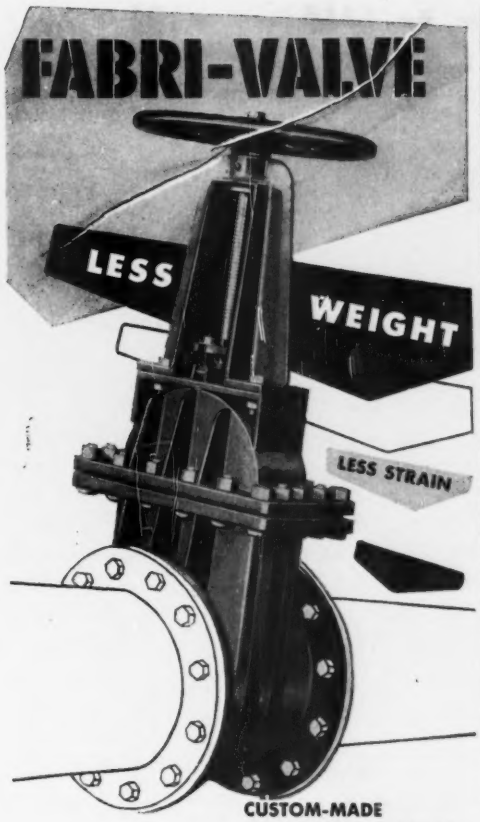

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Install corrosion-resistant saran lined steel pipe wherever you are piping chemicals and solvents. Because saran is extremely resistant to most chemicals and solvents, such installations will give dependable, long-term service and reduce shut-downs due to pipe repairs and replacements. In addition to minimum maintenance cost saran lined steel pipe brings you another important advantage: it is easily field fabricated. No intricate tools required, no waiting for special fabrication, no costly delays. *Saran lined steel pipe is manufactured by The Dow Chemical Company.*

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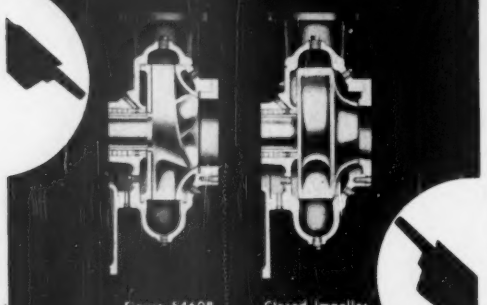
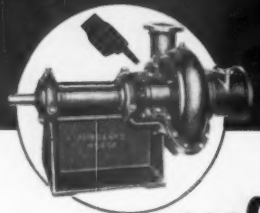


Figure 5460P Open Impeller

Closed Impeller Figure 5460



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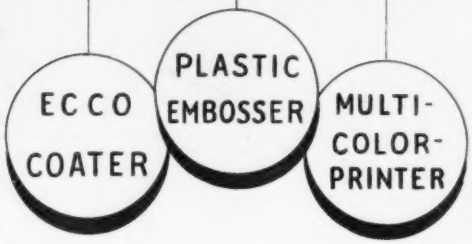

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NEW WALDRON EMBOSSER—a compact machine for vinyl coated fabrics, vinyl film and sheeting. Sufficient capacity and control to accomplish all embossed effects now in demand.

WALDRON MULTI-COLOR PRINTER—a gravure roller bearing print machine with provision for conversion to surface printing operations. Many new design features.

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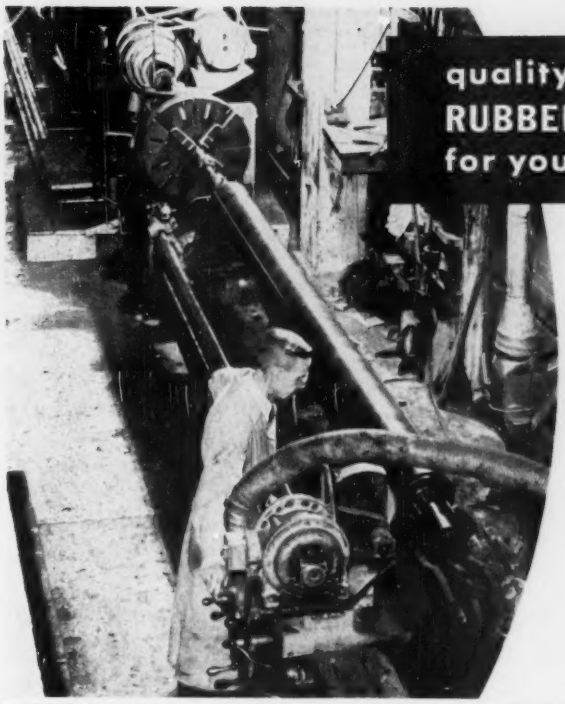

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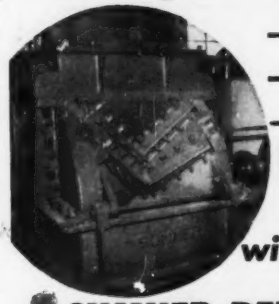

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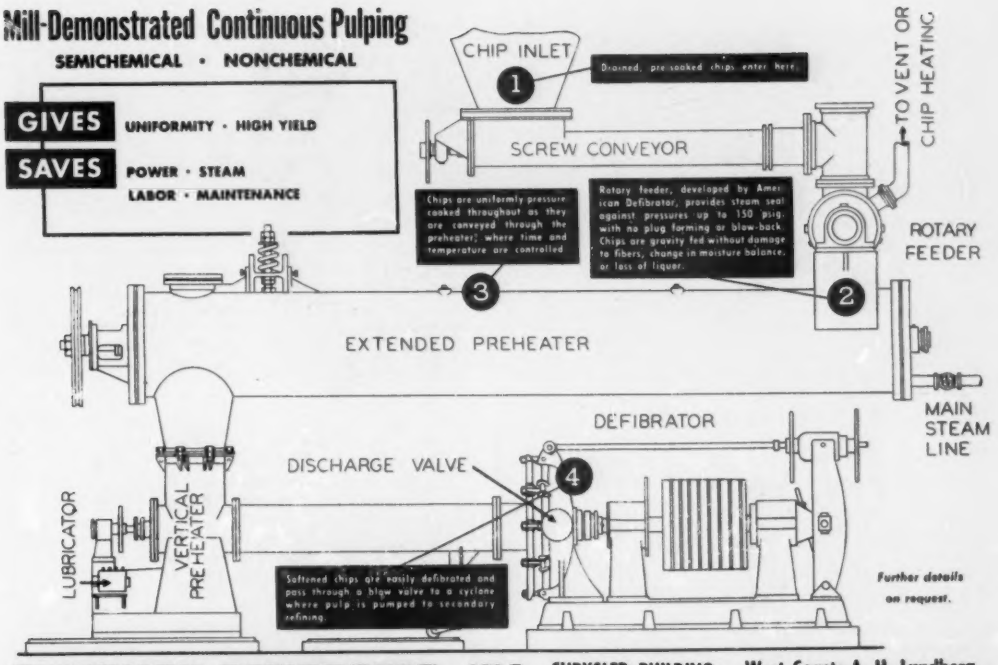
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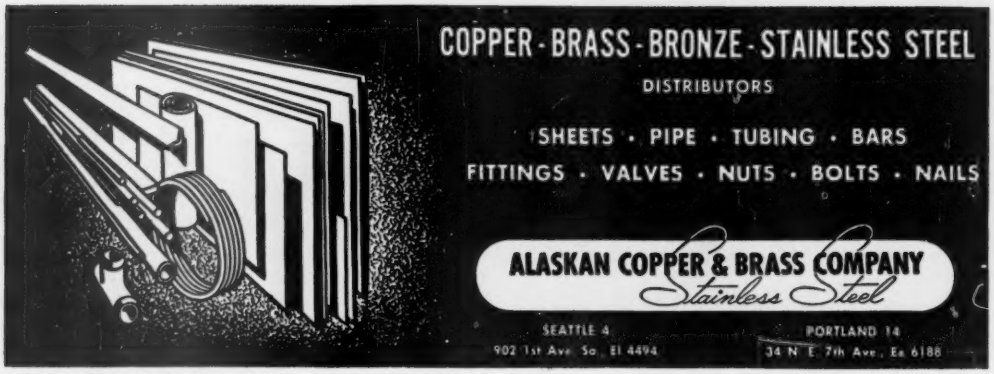
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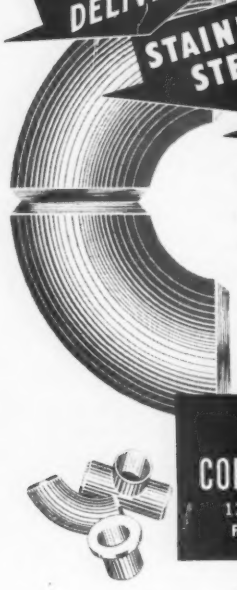

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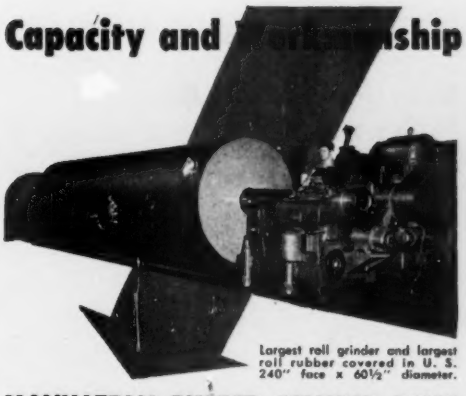

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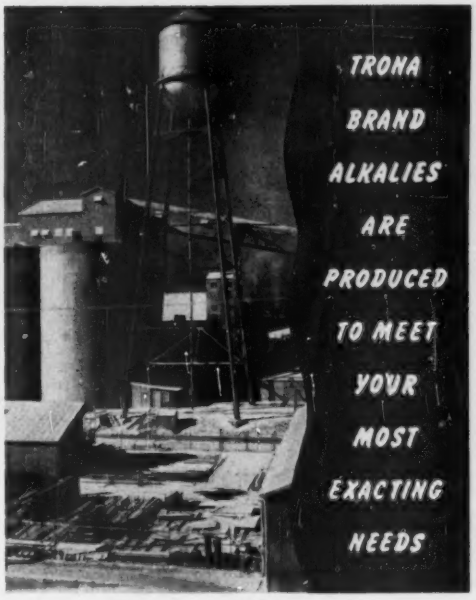

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FIRMS YOU SHOULD KNOW

Advertising Index

Alaskan Copper & Brass Co. 120
Allis-Chalmers Mfg. Co. ..... 5, 92 & Inside Back Cover
American Cyanamid Co. Industrial Chemical Division 27
American Defibrator Co. 119
American Potash & Chemical Corp. . 121
Appleton Wire Works 91
Appleton Woolen Mills 120
Asten-Hill Mfg. Co. 24

Babcock & Wilcox Co. 28
Bagley & Sewall Co. 119
Bauer Brothers Co. 112
Bearing Sales & Service, Inc. 105
Beloit Iron Works ..... 49 & 50
Biggs Boiler Works Co. 25
Bird Machine Co. 35
Black-Clawson Co. Divisions: Shartle Bros. Machine Co.; Dilts Machine Works; Kohler System 69
Bristol Company 67
Bulkley, Dunton Organization 55
Butterworth & Sons Co., H. W. 113

Cameron Machine Co. 53
Carpenter Steel Co., Carpenter Alloy Tube Division .. 56
Carthage Machine Co. 41
Chain Belt Co. 51
Chemipulp Process Inc. 123
Chromium Corp. of America 122
Clark-Aiken Co. 8
Classified Advertising 106
Clinton Foods, Inc. 118
Combustion Engineering-Superheater, Inc. 93
Corn Products Sales Co. 110
Crane Company 14

DeLaval Steam Turbine Co. 99
DeZurik Shower Co. 78
Dilts Machine Works 69
Dominion Engineering Co., Ltd. 101
Dorr Company 4
Dow Chemical Co. 115
Downingtown Mfg. Co. 73
Draper Bros. Co. 104

Electric Steel Foundry Co. 13

Fabri-Valve Co. of America 115
Fairbanks, Morse & Co. 45, 116
Farrel-Birmingham Co., Inc. 22
Fibre Making Processes, Inc. 111
Fiske Bros. Refining Co. 88
Fuller Company 43
Fulton Iron Works Co. 77

General American Transportation Corp. 12
General Dyestuff Corp. 89
Gilbert & Nash Co. 111
Gottesman & Company 2
Griffith Rubber Mills 117
Guest & Sons, C. M. 122

Hansel Engineering Co., Ltd. 122
Hercules Powder Co. 85
Hooker Electrochemical Co. 6
Hotel Lincoln 120
Huyck & Sons Co., F. C. 87

Infilco Incorporated 97
Ingersoll-Rand 114
Instrument Sales Co., Inc. 123
International Nickel Co. 10

Jenssen Co., Inc., G. D. 123
Johns-Manville Corp. 94
Johnsen, Jorgensen & Wettre, Ltd. . 75
Johnson & Co., Alvin H. 122
Jones & Sons Co., E. D. 7

Knox Woolen Co. 124
Kohler System 69

Langston Co., Samuel M. 26
Lindsay Wire Weaving Co. 107
Link-Belt Company 29, 63
Lubriplate Division Fiske Bros. Refining Co. 88
Lyddon & Company, Inc. 18

MacMillan & Bloedel Limited 112
Main, Inc., Chas. T. 123
Manhattan Rubber Division Raybestos-Manhattan, Inc. 121
Merrick Scale Mfg. Co. 122
Metcalf & Harstad Associates 122
Moore & White Co. 68
Morden Machines Co. 9
Morey Paper Mill Supply Co. 66
Mount Hope Machinery Co. 114
Murray Mfg. Co., D. J. 113

Nash Engineering Co. 103
National Aluminate Corp. 11
Northwest Copper Works, Inc. 120
Northwest Filter Co. 123
Northwest Lead Co. 123
Norton Company 76

O'Donoghue, Roderick 122
Oliver Corporation 89

Pacific Coast Supply Co. 106
Pacific Gear Works 23
Pacific Gear & Tool Works 23
Parsons & Whittemore, Inc. 18
Perkins-Goodwin Co. Outside Back Cover
Perkins & Son, Inc., B. F. 82
Powell Co., Wm. 61
Powell River Sales Co. 16
Puget Sound Pulp & Timber Co. 15
Puget Sound Sheet Metal Works ... 121
Pulp Bleaching Co. 122
Pusey & Jones Corp. 80

Rambo, W. H. 122
Raybestos-Manhattan, Inc. 121
Raymond Service, Inc., Chas. P. 106
Reichhold Chemicals, Inc. 57
Reliance Electric & Engineering Co. 64
Rice Barton Corp. 19
Robert & Company Associates 123
Roehlen Engraving Works, Inc. 122
Rogers & Co., S. C. 118
Roslund, John V. 117
Ross Engineering Corp., J. O. 39
Rust Engineering Co. 122

Sandwell & Company 123
Saran Lined Pipe Co. 115
Schultz & Co., C. D. 123
Shartle Bros. Machine Co. 69
Shuler & Benninghofen 108
Sirrine Co., J. E. 122
SKF Industries, Inc. 83
Smith Corp., A. O. 17
Smith & Winchester Mfg. Co. 102
Smythe, Ray 123
Sprout, Waldron & Co. 47
Stebbins Engineering Corp. 119
Stevenson & Rubens 122
Stowe-Woodward, Inc. Inside Front Cover
Sumner Iron Works 118
Sutherland, Inc. 65
Sutherland Refiner Corp. 1

Takahashi & Co., C. T. 121
Thomas & Associates, Inc., Ralph D. 123

Vulcan Copper & Supply Co. .. 20 & 21

Waldron Corp., John 116
Washington Iron Works 109
Western Gear Works 23
Western Precipitation Corp. 95
Weyerhaeuser Timber Co. 122
Wisconsin Wire Works 120

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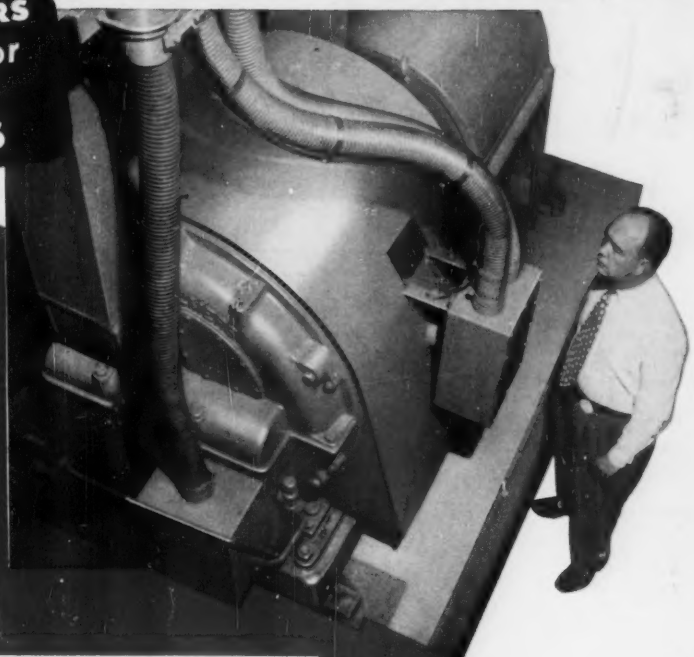

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